In Collaboration with
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CALIBRATION LABORATORY

CAICT

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2117
E-mail: emf@caict.ac.cn http://www.caict.ac.cn

DASY5 Validation Report for Head TSL Date: 2022-08-22

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1152

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.408 S/m; ε_r = 41.28; ρ = 1000 kg/m^3

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.52, 8.52, 8.52) @ 1750 MHz; Calibrated: 2022-01-26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2022-01-12
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.44 V/m; Power Drift = -0.05 dB

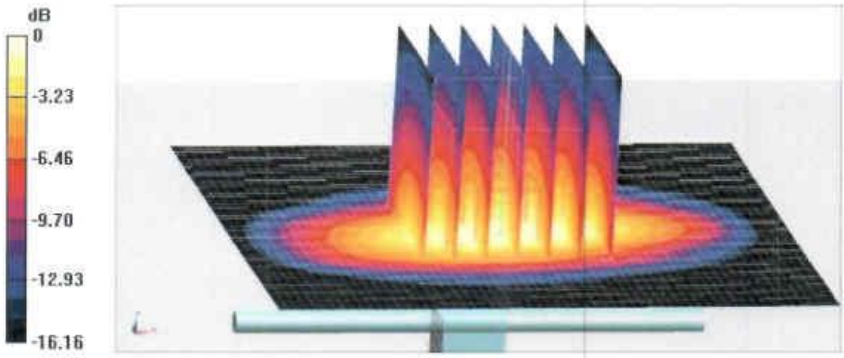
Peak SAR (extrapolated) = 16.5 W/kg

SAR(1 g) = 9.18 W/kg; SAR(10 g) = 4.94 W/kg

Smallest distance from peaks to all points 3 dB below = 10 mm

Ratio of SAR at M2 to SAR at M1 = 56.3%

Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.46 dBW/kg

Certificate No: Z22-60335 Page 5 of 6

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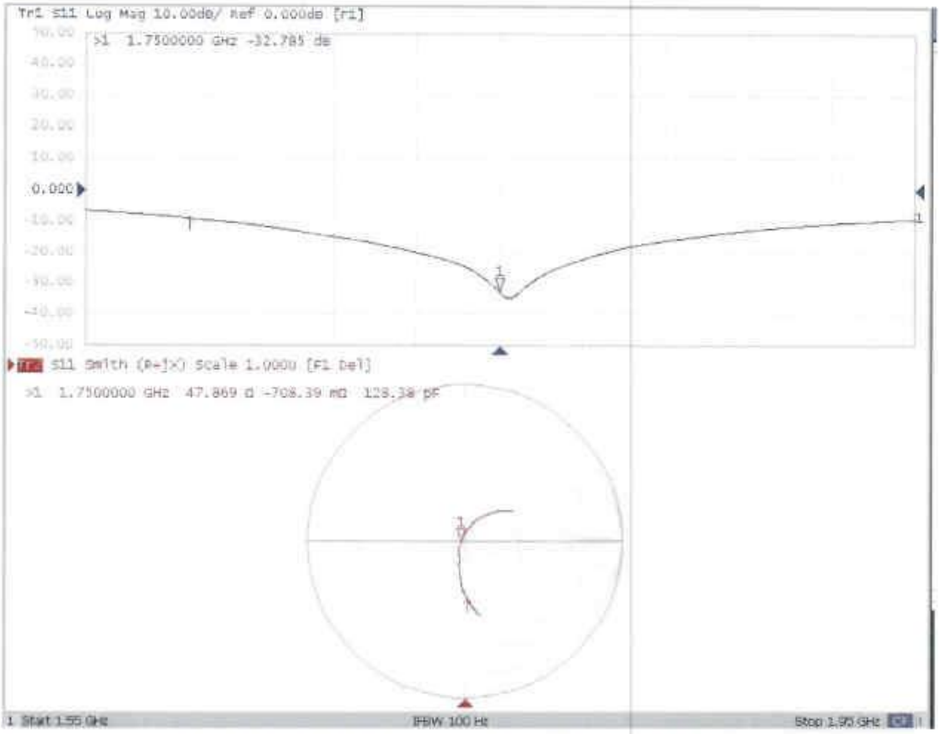
Impedance Measurement Plot for Head TSL



Certificate No: Z22-60335 Page 6 of 6

1900MHz Dipole

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Client SAICT Certificate No: Z21-60357

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d088
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	October 18, 2021

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	24-Sep-21 (CTTL, No.J21X08326)	Sep-22
Power sensor NRP8S	104291	24-Sep-21 (CTTL, No.J21X08326)	Sep-22
Reference Probe EX3DV4	SN 7517	03-Feb-21(CTTL-SPEAG,No.Z21-60001)	Feb-22
DAE4	SN 1556	15-Jan-21(SPEAG,No.DAE4-1556_Jan21)	Jan-22
Secondary Standards	**ID #**	**Cal Date (Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	01-Feb-21 (CTTL, No.J21X00593)	Jan-22
NetworkAnalyzer E5071C	MY46110673	14-Jan-21 (CTTL, No.J21X00232)	Jan-22

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: October 24, 2021

Certificate No: Z21-60357 Page 1 of 6

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E-mail: cttl@chinattl.com http://www.chinattl.cn

lossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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E-mail: cttl@chinattl.com http://www.chinattl.cn

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.9 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.2 W/kg ± 18.8 % (*k*=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.5 W/kg ± 18.7 % (*k*=2)**

Certificate No: Z21-60357 Page 3 of 6

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7Ω+ 6.80jΩ
Return Loss	- 22.6dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.110 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 10.18.2021

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d088

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.387 S/m; ε_r = 39.88; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7517; ConvF(7.81, 7.81, 7.81) @ 1900 MHz; Calibrated: 2021-02-03
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2021-01-15
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.6 V/m; Power Drift = 0.00 dB

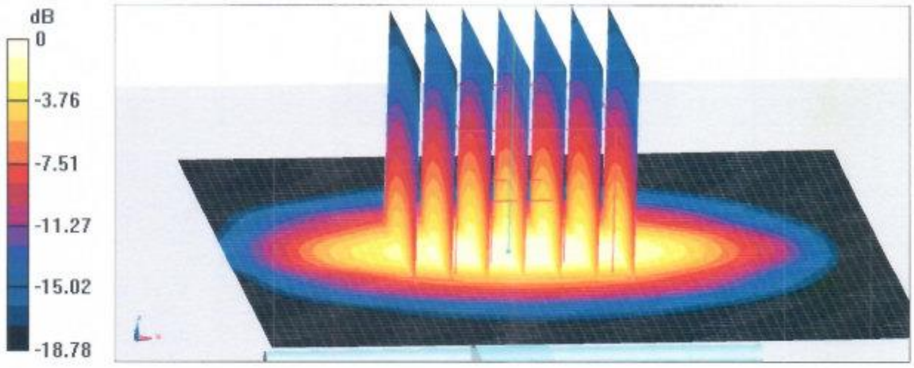
Peak SAR (extrapolated) = 19.2 W/kg

SAR(1 g) = 10 W/kg; SAR(10 g) = 5.1 W/kg

Smallest distance from peaks to all points 3 dB below = 10 mm

Ratio of SAR at M2 to SAR at M1 = 52.1%

Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.99 dBW/kg

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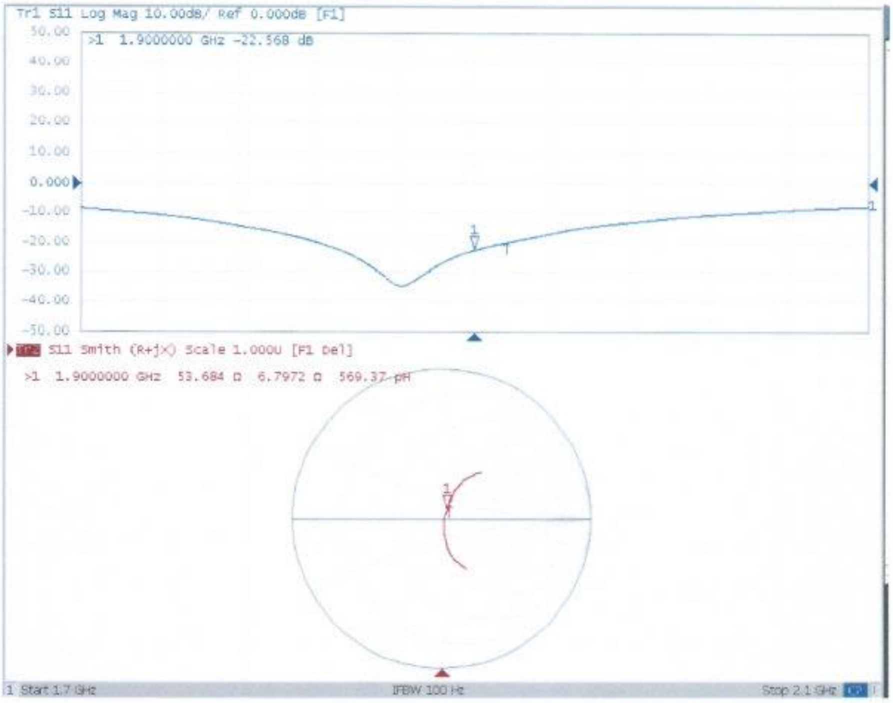
E-mail: cttl@chinattl.com http://www.chinattl.cn

Impedance Measurement Plot for Head TSL



Certificate No: Z21-60357 Page 6 of 6

2450MHz Dipole

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CALIBRATION
CNAS L0570

Client SAICT Certificate No: Z21-60358

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 873
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	October 21, 2021

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	24-Sep-21 (CTTL, No.J21X08326)	Sep-22
Power sensor NRP8S	104291	24-Sep-21 (CTTL, No.J21X08326)	Sep-22
Reference Probe EX3DV4	SN 7517	03-Feb-21(CTTL-SPEAG,No.Z21-60001)	Feb-22
DAE4	SN 1556	15-Jan-21(SPEAG,No.DAE4-1556_Jan21)	Jan-22
Secondary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	01-Feb-21 (CTTL, No.J21X00593)	Jan-22
NetworkAnalyzer E5071C	MY46110673	14-Jan-21 (CTTL, No.J21X00232)	Jan-22

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: October 27, 2021

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E-mail: cttl@chinattl.com http://www.chinattl.cn

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016

c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010

d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

Certificate No: Z21-60358 Page 2 of 6

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5 ± 6 %	1.81 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**53.2 W/kg ± 18.8 % (*k*=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.2 W/kg ± 18.7 % (*k*=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.6Ω+ 1.26jΩ
Return Loss	- 28.8dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.066 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL

Date: 10.21.2021

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 873

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.809 S/m; ε_r = 39.51; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7517; ConvF(7.34, 7.34, 7.34) @ 2450 MHz; Calibrated: 2021-02-03
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2021-01-15
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 108.0 V/m; Power Drift = -0.03 dB

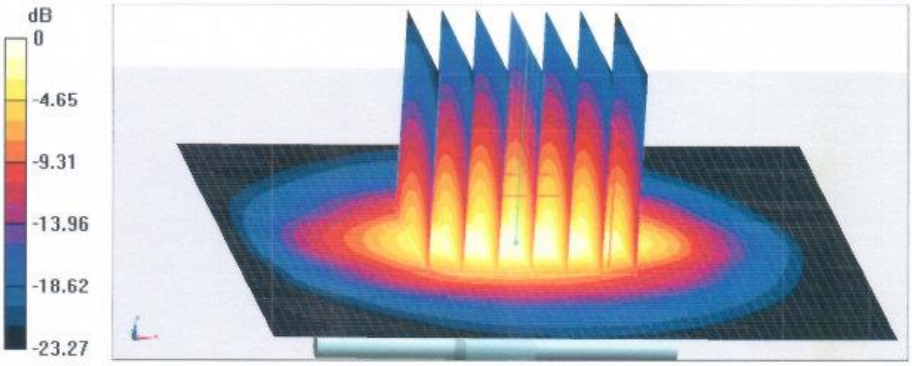
Peak SAR (extrapolated) = 28.0 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.05 W/kg

Smallest distance from peaks to all points 3 dB below = 9.2 mm

Ratio of SAR at M2 to SAR at M1 = 46.9%

Maximum value of SAR (measured) = 22.6 W/kg



0 dB = 22.6 W/kg = 13.54 dBW/kg

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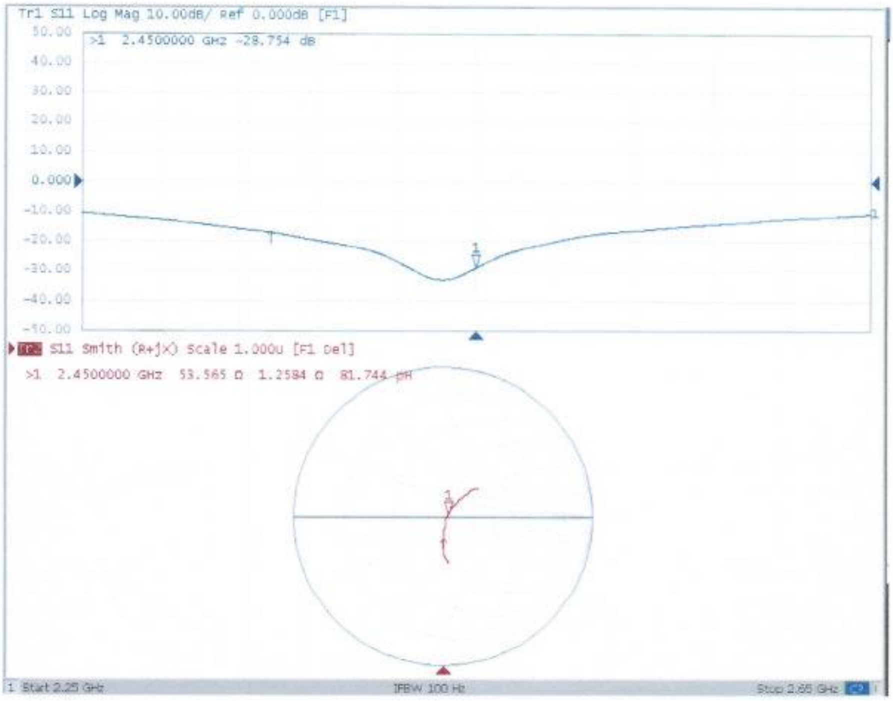
Impedance Measurement Plot for Head TSL



Certificate No: Z21-60358 Page 6 of 6

2550MHz Dipole

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **TMC-SZ (Auden)**

Certificate No: **D2550V2-1010_May21**

CALIBRATION CERTIFICATE

Object	D2550V2 - SN:1010
Calibration procedure(s)	QA CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	May 21, 2021

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Power sensor NRP-Z91	SN: 103244	09-Apr-21 (No. 217-03291)	Apr-22
Power sensor NRP-Z91	SN: 103245	09-Apr-21 (No. 217-03292)	Apr-22
Reference 20 dB Attenuator	SN: BH9394 (20k)	09-Apr-21 (No. 217-03343)	Apr-22
Type-N mismatch combination	SN: 310982 / 06327	09-Apr-21 (No. 217-03344)	Apr-22
Reference Probe EX3DV4	SN: 7349	28-Dec-20 (No. EX3-7349_Dec20)	Dec-21
DAE4	SN: 601	02-Nov-20 (No. DAE4-601_Nov20)	Nov-21

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

	Name	Function	Signature
Calibrated by:	Jeffrey Katzman	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 21, 2021

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D2550V2-1010_May21 Page 1 of 8

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2550 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.1	1.91 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.4 ± 6 %	1.99 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**55.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.6	2.09 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.8 ± 6 %	2.16 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.4 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**52.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.04 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.8 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.8 Ω - 3.8 jΩ
Return Loss	- 26.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.3 Ω - 1.8 jΩ
Return Loss	- 34.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.153 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 21.05.2021

Test Laboratory: SPEAG, Zurich, Switzerland

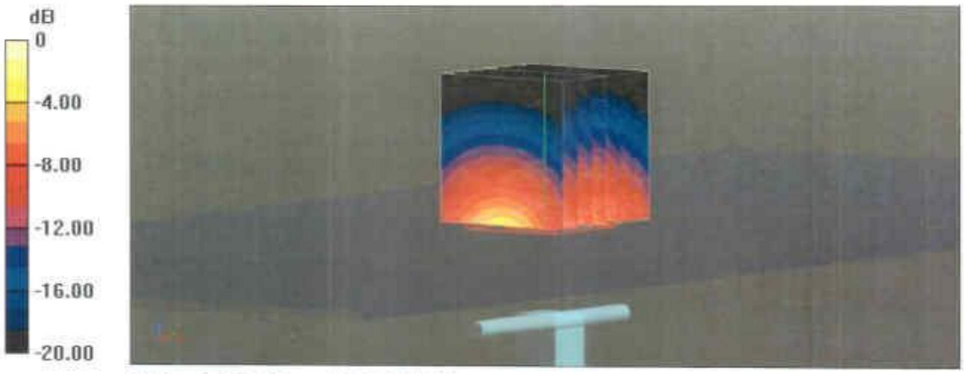
DUT: Dipole 2550 MHz; Type: D2550V2; Serial: D2550V2 - SN:1010

Communication System: UID 0 - CW; Frequency: 2550 MHz
Medium parameters used: f = 2550 MHz; σ = 1.99 S/m; ε_r = 37.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.85, 7.85, 7.85) @ 2550 MHz; Calibrated: 28.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

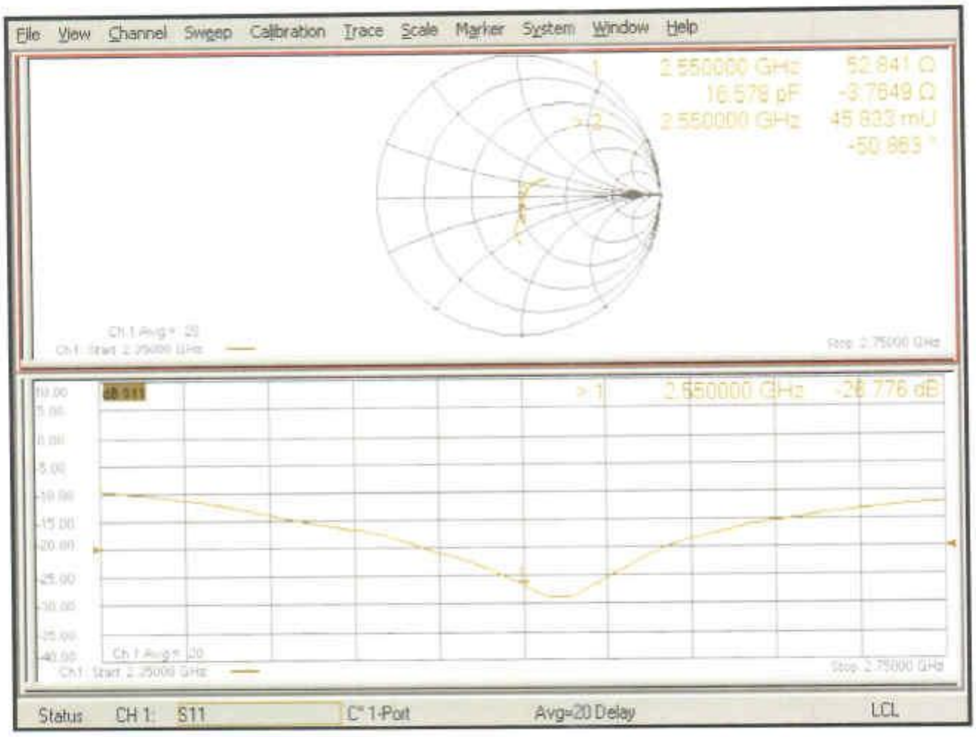
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 119.0 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.42 W/kg
Smallest distance from peaks to all points 3 dB below = 8.9 mm
Ratio of SAR at M2 to SAR at M1 = 48.2%
Maximum value of SAR (measured) = 24.3 W/kg



0 dB = 24.3 W/kg = 13.86 dBW/kg

Certificate No: D2550V2-1010_May21 Page 5 of 8

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 21.05.2021

Test Laboratory: SPEAG, Zurich, Switzerland

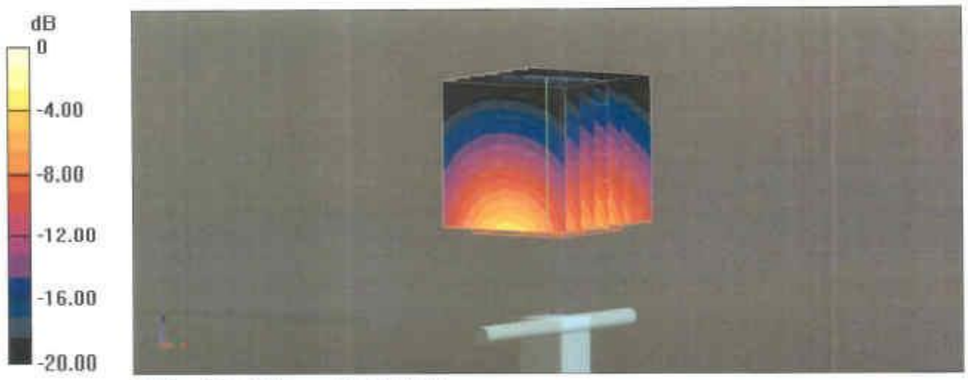
DUT: Dipole 2550 MHz; Type: D2550V2; Serial: D2550V2 - SN:1010

Communication System: UID 0 - CW; Frequency: 2550 MHz
Medium parameters used: f = 2550 MHz; σ = 2.16 S/m; ε_r = 50.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

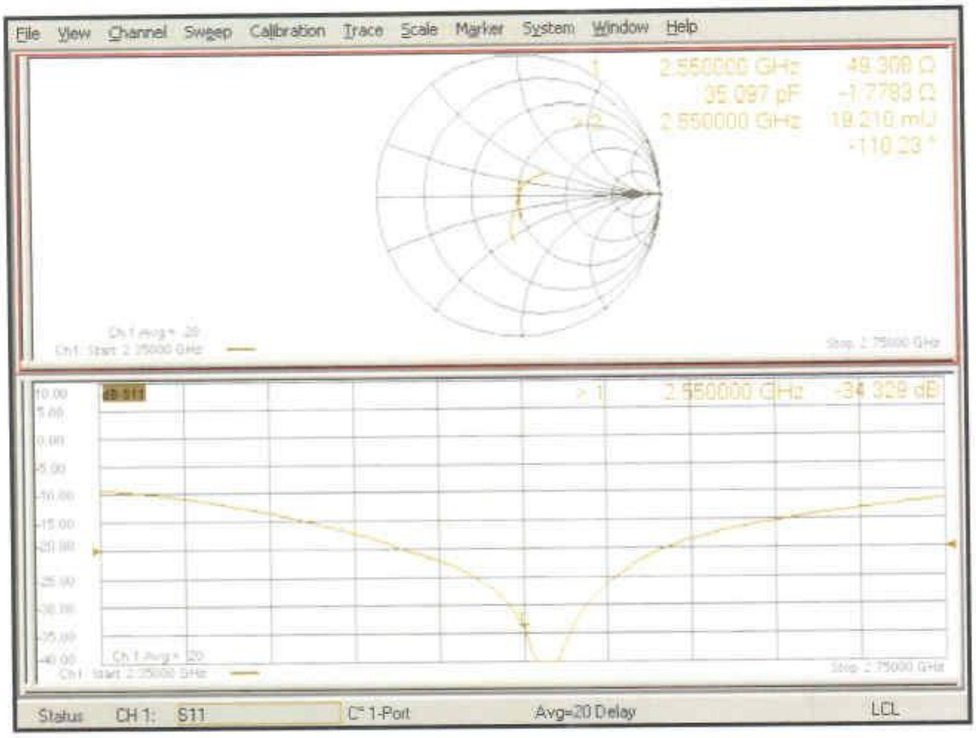
- Probe: EX3DV4 - SN7349; ConvF(7.98, 7.98, 7.98) @ 2550 MHz; Calibrated: 28.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 110.2 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 26.1 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.04 W/kg
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 51.9%
Maximum value of SAR (measured) = 22.1 W/kg



0 dB = 22.1 W/kg = 13.44 dBW/kg

Impedance Measurement Plot for Body TSL



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5GHz Dipole

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中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client **SAICT** **Certificate No: Z22-60336**

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN: 1238
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	August 17, 2022

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	24-Sep-21 (CTTL, No.J21X08326)	Sep-22
Power sensor NRP8S	104291	24-Sep-21 (CTTL, No.J21X08326)	Sep-22
Reference Probe EX3DV4	SN 7464	26-Jan-22(SPEAG,No.EX3-7464_Jan22)	Jan-23
DAE4	SN 1556	12-Jan-22(CTTL-SPEAG,No.Z22-60007)	Jan-23
Secondary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	13-Jan-22 (CTTL, No. J22X00409)	Jan-23
Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL, No.J22X00406)	Jan-23

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: August 23, 2022

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure for The Assessment of Specific Absorption Rate of Human Exposure to Radio Frequency Fields from Hand-held and Body-mounted Wireless Communication Devices- Part 1528: Human Models, Instrumentation and Procedures (Frequency range of 4 MHz to 10 GHz)", October 2020

b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

Certificate No: Z22-60336 Page 2 of 8

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz	

Head TSL parameters at 5250MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 ℃	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) ℃	36.3 ± 6 %	4.64 mho/m ± 6 %
Head TSL temperature change during test	<1.0 ℃	----	----

SAR result with Head TSL at 5250MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**79.7 W/kg ± 24.4 % (*k*=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.8 W/kg ± 24.2 % (*k*=2)**

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Head TSL parameters at 5600MHz
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 ℃	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) ℃	35.2 ± 6 %	5.01 mho/m ± 6 %
Head TSL temperature change during test	<1.0 ℃	----	----

SAR result with Head TSL at 5600MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**82.6 W/kg ± 24.4 % (*k*=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.6 W/kg ± 24.2 % (*k*=2)**

Head TSL parameters at 5750MHz
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 ℃	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) ℃	35.0 ± 6 %	5.18 mho/m ± 6 %
Head TSL temperature change during test	<1.0 ℃	----	----

SAR result with Head TSL at 5750MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.87 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**78.5 W/kg ± 24.4 % (*k*=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.22 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.1 W/kg ± 24.2 % (*k*=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL at 5250MHz

Impedance, transformed to feed point	48.4Ω- 3.36jΩ
Return Loss	- 28.5dB

Antenna Parameters with Head TSL at 5600MHz

Impedance, transformed to feed point	50.8Ω+ 2.69jΩ
Return Loss	- 31.1dB

Antenna Parameters with Head TSL at 5750MHz

Impedance, transformed to feed point	53.5Ω+ 2.34jΩ
Return Loss	- 27.9dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.098 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 2022-08-17

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1238

Communication System: CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz Duty Cycle: 1:1

Medium parameters used: f = 5250 MHz; σ = 4.643 S/m; ε_r = 36.34; ρ = 1000 kg/m^3

Medium parameters used: f = 5600 MHz; σ = 5.006 S/m; ε_r = 35.17; ρ = 1000 kg/m^3

Medium parameters used: f = 5750 MHz; σ = 5.18 S/m; ε_r = 34.96; ρ = 1000 kg/m^3

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(5.43, 5.43, 5.43) @ 5250 MHz; ConvF(4.91, 4.91, 4.91) @ 5600 MHz; ConvF(4.85, 4.85, 4.85) @ 5750 MHz; Calibrated: 2022-01-26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2022-01-12
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration /Pin=100mW, d=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.66 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 7.95 W/kg; SAR(10 g) = 2.27 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65.1%
Maximum value of SAR (measured) = 18.8 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.44 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 35.2 W/kg
SAR(1 g) = 8.28 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 63.5%
Maximum value of SAR (measured) = 20.1 W/kg

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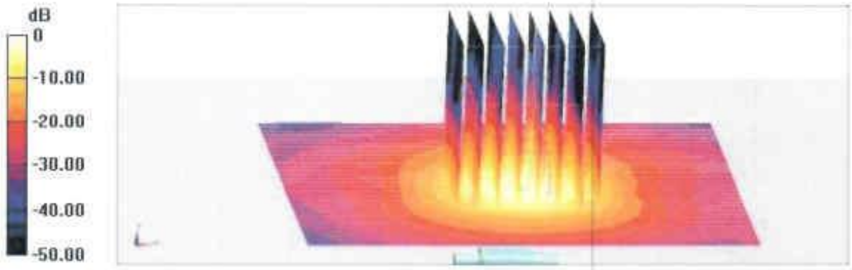
Dipole Calibration /Pin=100mW, d=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.17 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 35.8 W/kg
SAR(1 g) = 7.87 W/kg; SAR(10 g) = 2.22 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 61.3%
Maximum value of SAR (measured) = 19.4 W/kg



0 dB = 19.4 W/kg = 12.88 dBW/kg

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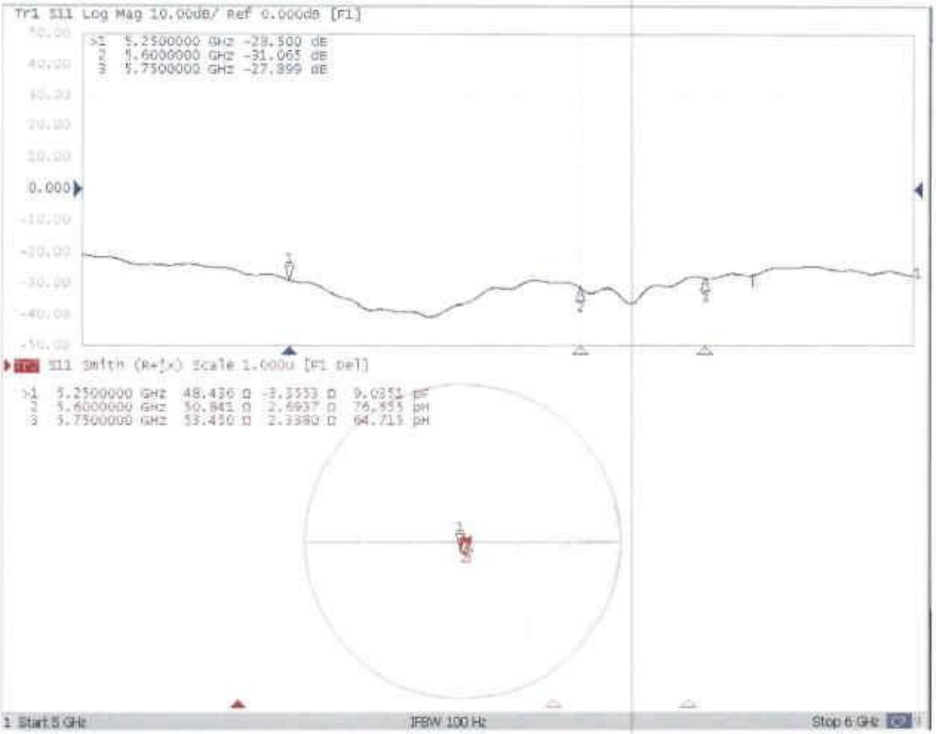
Impedance Measurement Plot for Head TSL



ANNEX J: Extended Calibration SAR Dipole

Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dBm, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

Justification of Extended Calibration SAR Dipole D2550V2– serial no.1010

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2021-05-21	-26.8	/	52.8	/	-3.80	/
2022-05-20	-26.3	1.9	53.6	0.8	-3.64	0.16

The Return-Loss is <-20dB, and within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the value result should support extended cabration.

ANNEX K: Proximity sensor Power reduction information

In this section, the following list is used to prepare an inquiry seeking SAR test guidance for proximity sensor power reduction. The procedure in KDB 616217 is applied for SAR testing.

K.1. General Proximity sensor implementation description

This device uses a proximity sensor that uses the SAR antenna to facilitate triggering in typical user interactivity with the device. Due to the operating configurations and exposure conditions required by the device, the proximity sensor is used to indicate when the phone is held close to a user's body exposure condition. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes to ensure SAR compliance for the following scenarios: To reduce the output power of main antennas during body close to device.

K.2. Antennas and sensor placement details

K2.1. Antenna-to-antenna/user separation distances

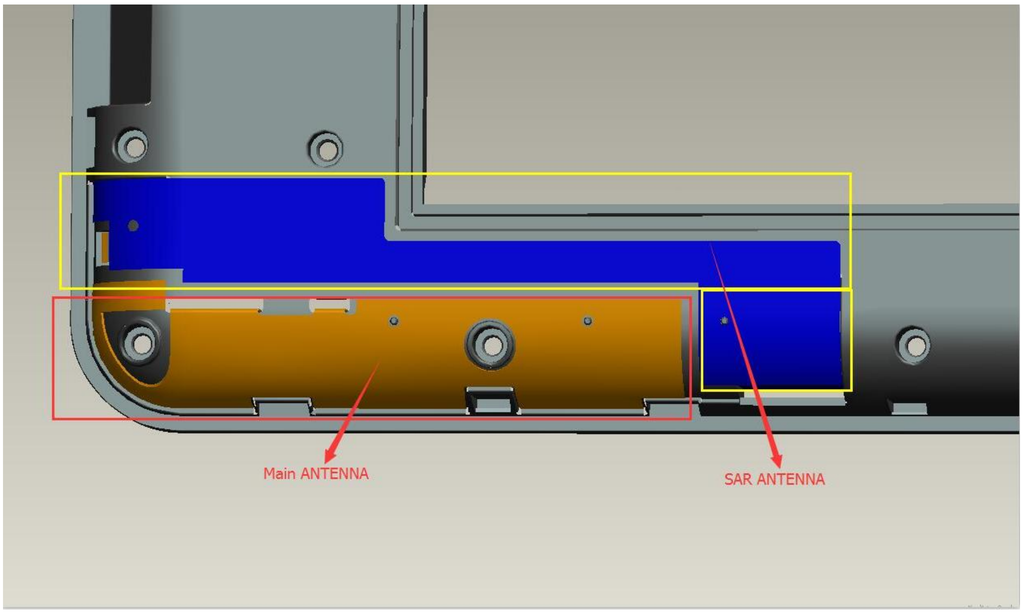


Figure K.1: The location of the antennas and proximity sensor

Note: The Div Antenna and GPS Antenna does not have the transmit function.
The proximity sensor and SAR antenna use same metallic electrode, the SAR antenna is separated from the main antenna.

	Antenna/Sensor-to- DUT sides separation distances					
Tx Antenna	**Front side**	**Back side**	**Left side**	**Right side**	**Top side**	**Bottom side**
Main 2G&3G&4G Antenna	N/A	15mm	15mm	N/A	N/A	5mm
2.4G WiFi Antenna	N/A	N/A	N/A	N/A	N/A	N/A
Diversity antenna and GPS antenna	Only receive signal, so it was not figured out in the following pictures					

K.3. Proximity sensor clarification

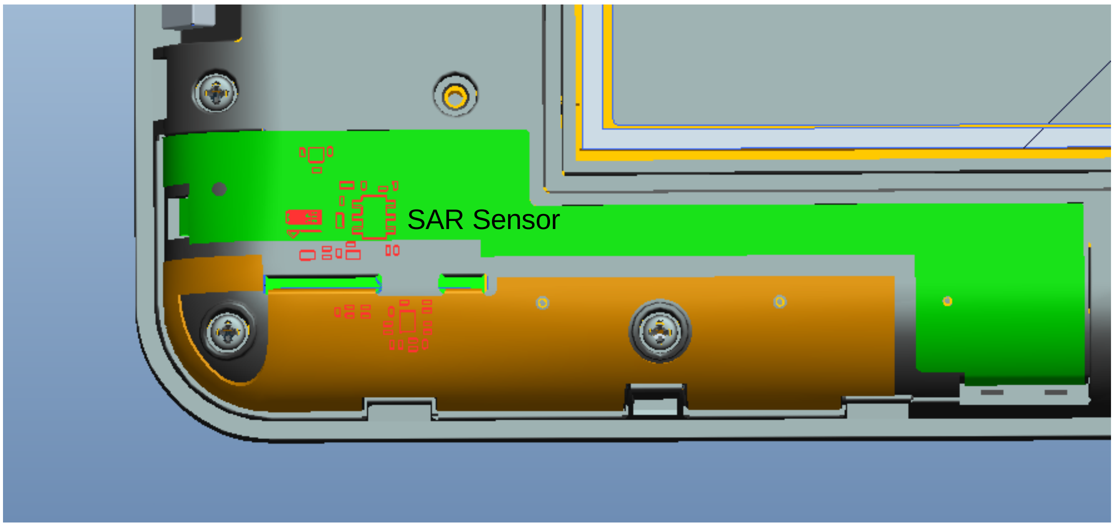


Figure K.2: The picture of the SAR sensor

K.3.1. Description of proximity sensor Techniques

The proximity sensor is triggered by capacitance changes due to objects in the vicinity of the sensing element.

Capacitive proximity sensor share metallic electrode with the SAR antenna testing. The metallic electrode and SAR sensor chip works as a sensor. As is shown in Figure K.2.

The proximity sensor or the power reduction cannot be intentionally or unintentionally turned-off by the user.

The expected capacitance trigger values are programmed in each device for each power back-off stage. Capacitance trigger value is C1. When a certain object or human body approaches the DUT, if the measured capacitance is lower than C1, proximity sensor is not triggered. If the measured capacitance is equal to C1 or higher than C1, the power back-off is triggered.

There is a failure protection gear. If the SAR sensor fail, the detection of the SAR sensor signal is interrupted, it will jump to the failure protection gear to reduce power by a fixed maximum power reduction amplitude to ensure SAR compliance.

K.3.2. Power Reduction operation table

The phone use MTK platform, which have some special NVs for SAR related max power back off, These NVs are used to set a new max power limit based proximity information and call configuration. When human body is in proximity and is detected by sensor, a new max power limit is set using the values stored in the NV. If Base station requests the higher output power above the limit, the power control algorithm inside modem chip will limit the power up to the preset power limit. If base station requests a lower output power less than the limit, the out power is controlled by base station.

K.4. Proximity sensor coverage, distance and angle

Band	Test position	Sensor Trigger Distance range(DUT to Phantom)	Power reduction amount(dB)	Target Power level（dBm）
GSM850	Extremity SAR (Bottom/Back/Left)	held by hand 0mm	4	GPRS
				1 Txslot:28.5
				2 Txslot:27.5
				3 Txslot:26
				4 Txslot:25
				EGPRS
				1 Txslot:23.5
				2 Txslot:22
				3 Txslot:20
				4 Txslot:18.5
	Top side	ALL	0	GPRS
				1 Txslot:32.5
				2 Txslot:31.5
				3 Txslot:30
				4 Txslot:29
				EGPRS
				1 Txslot:27.5
				2 Txslot:26
				3 Txslot:24
				4 Txslot:22.5
	Back side	0<distance≤15mm	4	GPRS
				1 Txslot:28.5
				2 Txslot:27.5
				3 Txslot:26
				4 Txslot:25
				EGPRS
				1 Txslot:23.5
				2 Txslot:22
				3 Txslot:20
				4 Txslot:18.5
		15mm<distance	0	GPRS
				1 Txslot:32.5
				2 Txslot:31.5
				3 Txslot:30
				4 Txslot:29
				EGPRS
				1 Txslot:27.5

				2 Txslot:26
				3 Txslot:24
				4 Txslot:22.5
	Left side	0<distance≤15mm	4	GPRS
				1 Txslot:28.5
				2 Txslot:27.5
				3 Txslot:26
				4 Txslot:25
				EGPRS
				1 Txslot:23.5
				2 Txslot:22
				3 Txslot:20
				4 Txslot:18.5
		15mm<distance	0	GPRS
				1 Txslot:32.5
				2 Txslot:31.5
				3 Txslot:30
				4 Txslot:29
				EGPRS
				1 Txslot:27.5
				2 Txslot:26
				3 Txslot:24
				4 Txslot:22.5
	Bottom side	0<distance≤5mm	4	GPRS
				1 Txslot:28.5
				2 Txslot:27.5
				3 Txslot:26
				4 Txslot:25
				EGPRS
				1 Txslot:23.5
				2 Txslot:22
				3 Txslot:20
				4 Txslot:18.5
		5mm<distance	0	GPRS
				1 Txslot:32.5
				2 Txslot:31.5
				3 Txslot:30
				4 Txslot:29
				EGPRS
				1 Txslot:27.5
				2 Txslot:26
				3 Txslot:24
				4 Txslot:22.5

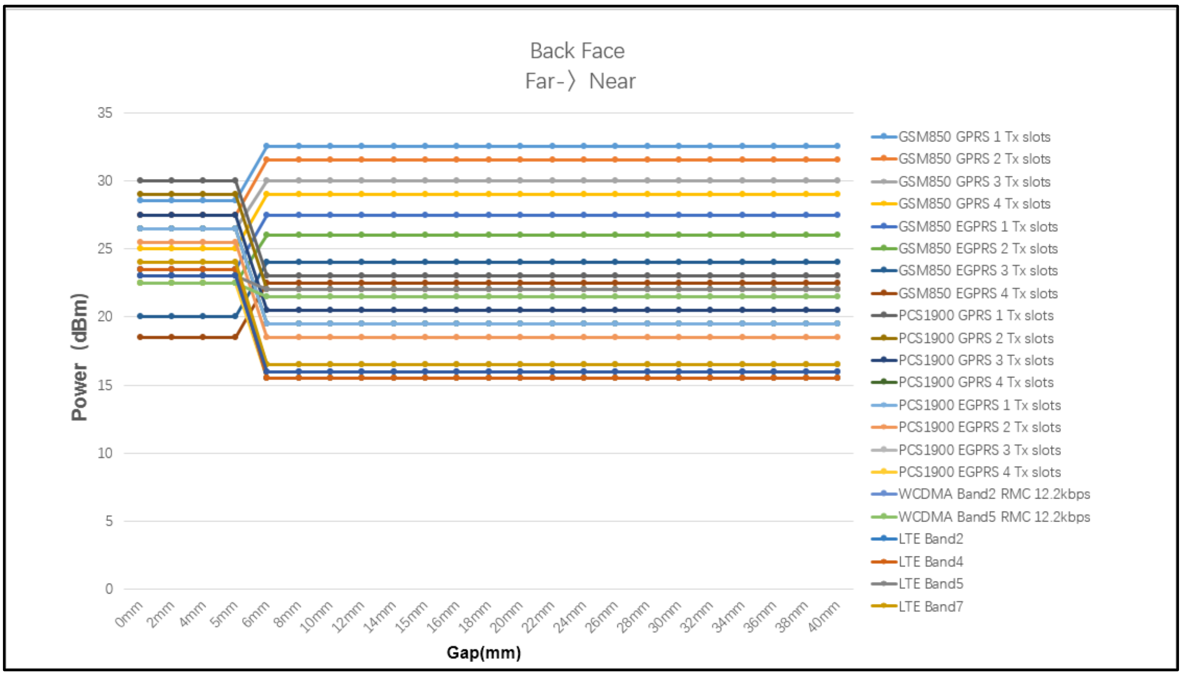
	Right side	ALL	0	GPRS
				1 Txslot:32.5
				2 Txslot:31.5
				3 Txslot:30
				4 Txslot:29
				EGPS
				1 Txslot:27.5
				2 Txslot:26
				3 Txslot:24
				4 Txslot:22.5
	Front side	ALL	0	GPRS
				1 Txslot:32.5
				2 Txslot:31.5
				3 Txslot:30
				4 Txslot:29
				EGPS
				1 Txslot:27.5
				2 Txslot:26
				3 Txslot:24
				4 Txslot:22.5
PCS1900	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	7	GPRS
				1 Txslot:23
				2 Txslot:22
				3 Txslot:20.5
				4 Txslot:19.5
				EGPS
				1 Txslot:19.5
				2 Txslot:18.5
				3 Txslot:16.5
				4 Txslot:15.5
	Top side	ALL	0	GPRS
				1 Txslot:30
				2 Txslot:29
				3 Txslot:27.5
				4 Txslot:26.5
				EGPS
				1 Txslot:26.5
				2 Txslot:25.5
				3 Txslot:23.5
				4 Txslot:22.5
	Back side	0<distance≤15mm	7	GPRS
				1 Txslot:23
				2 Txslot:22

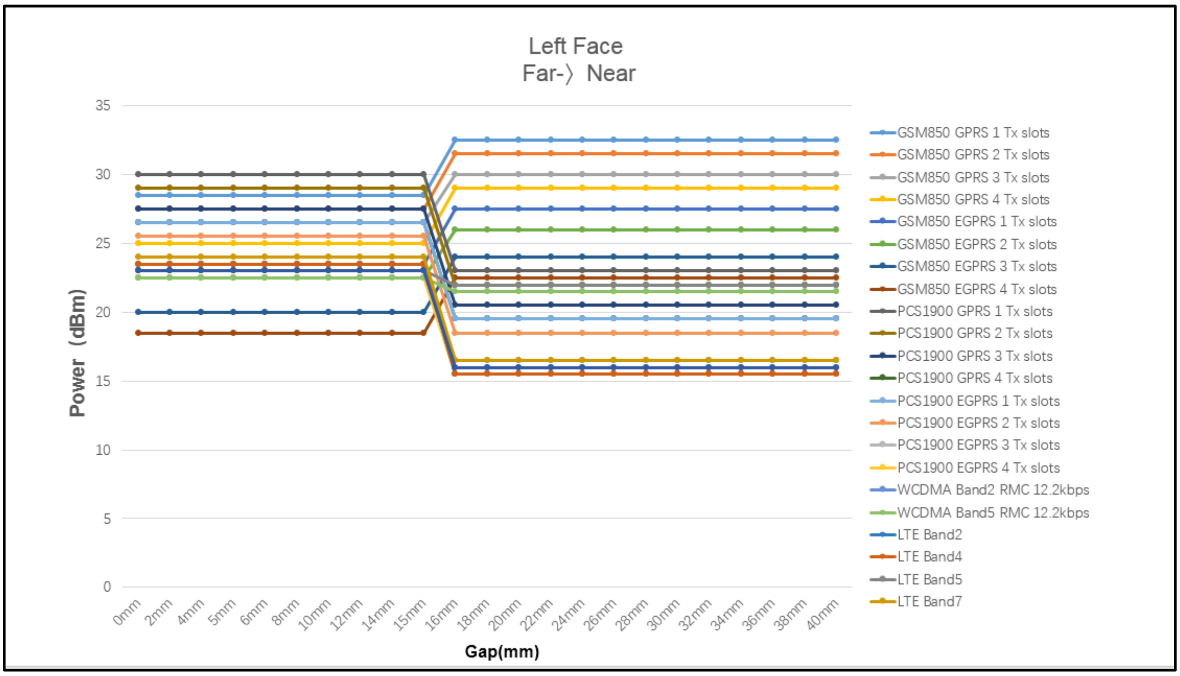
				3 Txslot:20.5
				4 Txslot:19.5
				EGPS
				1 Txslot:19.5
				2 Txslot:18.5
				3 Txslot:16.5
				4 Txslot:15.5
		15mm<distance	0	GPRS
				1 Txslot:30
				2 Txslot:29
				3 Txslot:27.5
				4 Txslot:26.5
				EGPS
				1 Txslot:26.5
				2 Txslot:25.5
				3 Txslot:23.5
				4 Txslot:22.5
	Left side	0<distance≤15mm	7	GPRS
				1 Txslot:23
				2 Txslot:22
				3 Txslot:20.5
				4 Txslot:19.5
				EGPS
				1 Txslot:19.5
				2 Txslot:18.5
				3 Txslot:16.5
				4 Txslot:15.5
		15mm<distance	0	GPRS
				1 Txslot:30
				2 Txslot:29
				3 Txslot:27.5
				4 Txslot:26.5
				EGPS
				1 Txslot:26.5
				2 Txslot:25.5
				3 Txslot:23.5
				4 Txslot:22.5
	Bottom side	0<distance≤5mm	7	GPRS
				1 Txslot:23
				2 Txslot:22
				3 Txslot:20.5
				4 Txslot:19.5
				EGPS

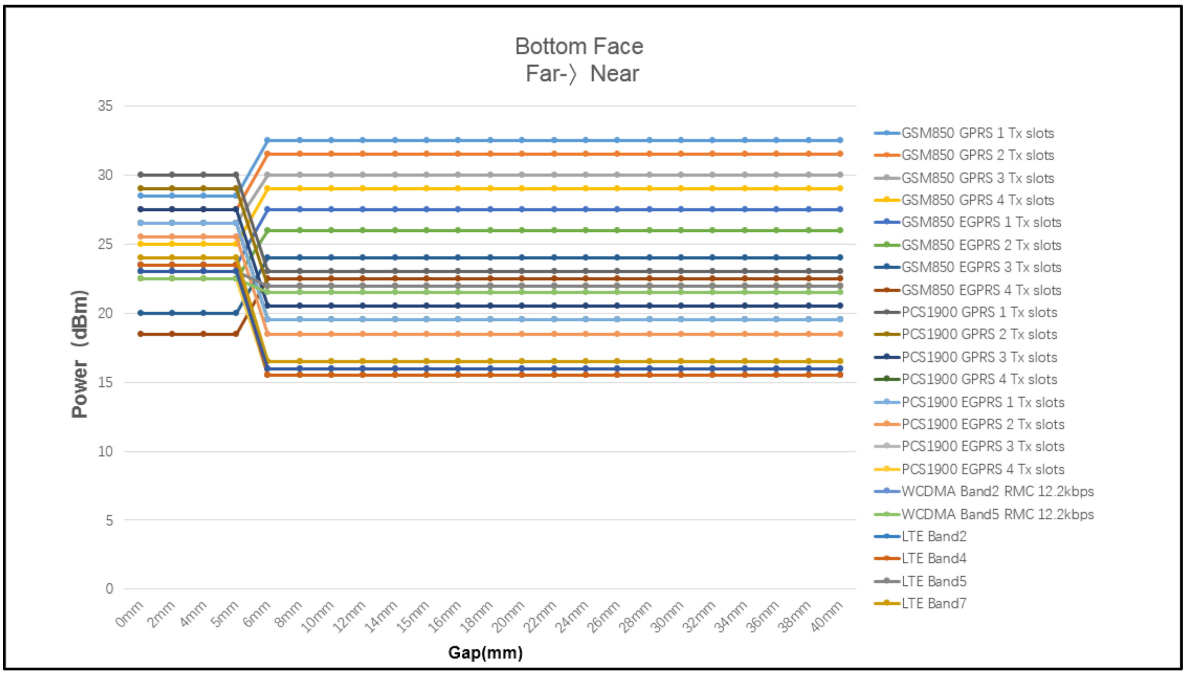
				1 Txslot:19.5
				2 Txslot:18.5
				3 Txslot:16.5
				4 Txslot:15.5
		5mm<distance	0	GPRS
				1 Txslot:30
				2 Txslot:29
				3 Txslot:27.5
				4 Txslot:26.5
				EGPS
				1 Txslot:26.5
				2 Txslot:25.5
				3 Txslot:23.5
				4 Txslot:22.5
	Right side	ALL	0	GPRS
				1 Txslot:30
				2 Txslot:29
				3 Txslot:27.5
				4 Txslot:26.5
				EGPS
				1 Txslot:26.5
				2 Txslot:25.5
				3 Txslot:23.5
				4 Txslot:22.5
	Front side	ALL	0	GPRS
				1 Txslot:30
				2 Txslot:29
				3 Txslot:27.5
				4 Txslot:26.5
				EGPS
				1 Txslot:26.5
				2 Txslot:25.5
				3 Txslot:23.5
				4 Txslot:22.5
WCDMA B2	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	7	16
	Top side	ALL	0	23
	Back side	0<distance≤15mm	7	16
		15mm<distance	0	23
	Left side	0<distance≤15mm	7	16
		15mm<distance	0	23
	Bottom side	0<distance≤5mm	7	16
		5mm<distance	0	23

	Right side	ALL	0	23
	Front side	ALL	0	23
WCDMA B5	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	1	21.5
	Top side	ALL	0	22.5
	Back side	0<distance≤15mm	1	21.5
		15mm<distance	0	22.5
	Left side	0<distance≤15mm	1	21.5
		15mm<distance	0	22.5
	Bottom side	0<distance≤5mm	1	21.5
		5mm<distance	0	22.5
	Right side	ALL	0	22.5
	Front side	ALL	0	22.5
LTE B2	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	7.5	15.5
	Top side	ALL	0	23
	Back side	0<distance≤15mm	7.5	15.5
		15mm<distance	0	23
	Left side	0<distance≤15mm	7.5	15.5
		15mm<distance	0	23
	Bottom side	0<distance≤5mm	7.5	15.5
		5mm<distance	0	23
	Right side	ALL	0	23
	Front side	ALL	0	23
LTE B4	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	7.5	15.5
	Top side	ALL	0	23
	Back side	0<distance≤15mm	7.5	15.5
		15mm<distance	0	23
	Left side	0<distance≤15mm	7.5	15.5
		15mm<distance	0	23
	Bottom side	0<distance≤5mm	7.5	15.5
		5mm<distance	0	23
	Right side	ALL	0	23
	Front side	ALL	0	23
LTE B5	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	1	22
	Top side	ALL	0	23
	Back side	0<distance≤15mm	1	22
		15mm<distance	0	23
	Left side	0<distance≤15mm	1	22
		15mm<distance	0	23
	Bottom side	0<distance≤5mm	1	22

		5mm<distance	0	23
	Right side	ALL	0	23
	Front side	ALL	0	23
LTE B7	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	7.5	16.5
	Top side	ALL	0	24
	Back side	0<distance≤15mm	7.5	16.5
		15mm<distance	0	24
	Left side	0<distance≤15mm	7.5	16.5
		15mm<distance	0	24
	Bottom side	0<distance≤5mm	7.5	16.5
		5mm<distance	0	24
	Right side	ALL	0	24
	Front side	ALL	0	24
LTE B38	Extremity SAR(Bottom/Back/Left)	held by hand 0mm	7	16
	Top side	ALL	0	23
	Back side	0<distance≤15mm	7	16
		15mm<distance	0	23
	Left side	0<distance≤15mm	7	16
		15mm<distance	0	23
	Bottom side	0<distance≤5mm	7	16
		5mm<distance	0	23
	Right side	ALL	0	23
	Front side	ALL	0	23

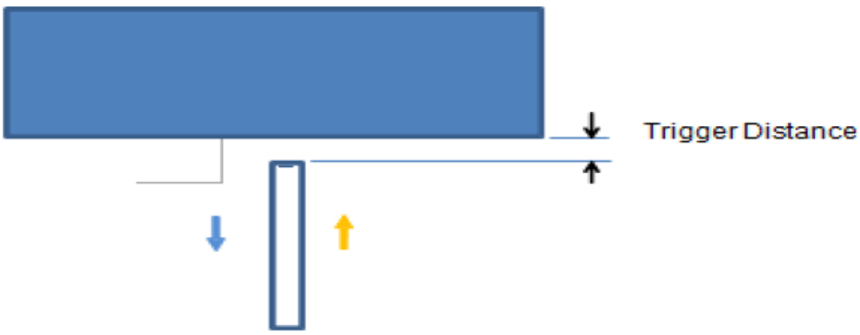

Back Face
Far-〉Near
Power（dBm)
Gap(mm)
GSM850 GPRS 1 Tx slots
GSM850 GPRS 2 Tx slots
GSM850 GPRS 3 Tx slots
GSM850 GPRS 4 Tx slots
GSM850 EGPRS 1 Tx slots
GSM850 EGPRS 2 Tx slots
GSM850 EGPRS 3 Tx slots
GSM850 EGPRS 4 Tx slots
PCS1900 GPRS 1 Tx slots
PCS1900 GPRS 2 Tx slots
PCS1900 GPRS 3 Tx slots
PCS1900 GPRS 4 Tx slots
PCS1900 EGPRS 1 Tx slots
PCS1900 EGPRS 2 Tx slots
PCS1900 EGPRS 3 Tx slots
PCS1900 EGPRS 4 Tx slots
WCDMA Band2 RMC 12.2kbps
WCDMA Band5 RMC 12.2kbps
LTE Band2
LTE Band4
LTE Band5
LTE Band7


Left Face
Far-〉Near
Power（dBm)
Gap(mm)
GSM850 GPRS 1 Tx slots
GSM850 GPRS 2 Tx slots
GSM850 GPRS 3 Tx slots
GSM850 GPRS 4 Tx slots
GSM850 EGPRS 1 Tx slots
GSM850 EGPRS 2 Tx slots
GSM850 EGPRS 3 Tx slots
GSM850 EGPRS 4 Tx slots
PCS1900 GPRS 1 Tx slots
PCS1900 GPRS 2 Tx slots
PCS1900 GPRS 3 Tx slots
PCS1900 GPRS 4 Tx slots
PCS1900 EGPRS 1 Tx slots
PCS1900 EGPRS 2 Tx slots
PCS1900 EGPRS 3 Tx slots
PCS1900 EGPRS 4 Tx slots
WCDMA Band2 RMC 12.2kbps
WCDMA Band5 RMC 12.2kbps
LTE Band2
LTE Band4
LTE Band5
LTE Band7



K.4.1. Procedures for determining proximity sensor triggering distances (Per KDB616217§6.2)

Per FCC KDB 616217 D04v01, the device was tested by the test lab to determine the proximity sensor triggering distances for the back side and each top side of the device. To ensure all production units are compliant, the smallest separation distance determined by the sensor triggering minus 1 mm, must be used as the test separation distance for SAR testing. These SAR tests are included in addition to the SAR tests for the device touching the SAR phantom with reduced power.



Picture: Proximity sensor triggering distances assessment (Tops)

Picture: Proximity sensor triggering distances assessment (Back)

Table: Summary of Trigger Distances

Liquid Type(MHz)	Trigger distance – bottom side		Trigger distance –back side		Trigger distance –left side	
	Moving toward phantom	Moving toward phantom	Moving from phantom	Moving from phantom	Moving toward phantom	Moving from phantom
835	5mm	5mm	15mm	15mm	15mm	15mm
1750	5mm	5mm	15mm	15mm	15mm	15mm
1900	5mm	5mm	15mm	15mm	15mm	15mm
2550	5mm	5mm	15mm	15mm	15mm	15mm

Note:

1) For Bottom side, based on the most conservative measured triggering distance of N mm, additional SAR test is required at (N-1) mm.

2) For Back side, based on the most conservative measured triggering distance of N mm, additional SAR test is required at (N-1) mm.

3) For Left side, based on the most conservative measured triggering distance of N mm, additional SAR test is required at (N-1) mm.

The proximity sensor is not triggered, when approaching from other sides (Front, Right, and TOP). Therefore, the proximity sensor coverage is not evaluated on these orientations.

K.4.2. Procedures for determining antenna and proximity sensor coverage (Per KDB616217 §6.3)

The proximity sensor and SAR antenna use same metallic electrode, so there is no spatial offset.

K.4.3. Procedures for determining device tilt angle influences to proximity sensor triggering (Per KDB616217 §6.4)

Per FCC KDB 616217 D04v01, the DUT was positioned directly below the flat phantom at the minimum measured trigger distance with each applicable top parallel to the base of the flat phantom for each band.

The EUT was rotated about each applicable top for angles up to +/- 45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to +/- 45°.

Picture: Proximity sensor tilt angle assessment

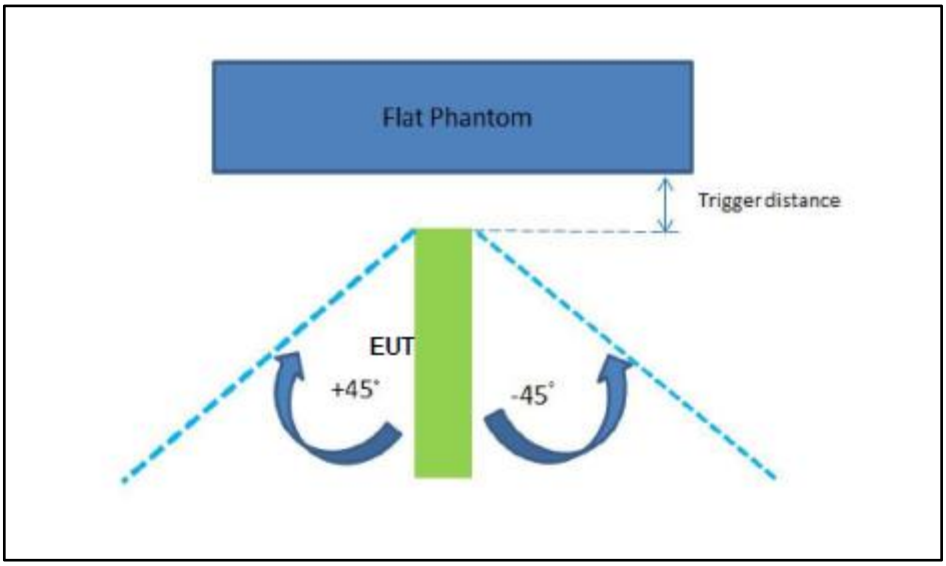


Table: Summary of Phone Tilt Angle Influence to Proximity Sensor Triggering

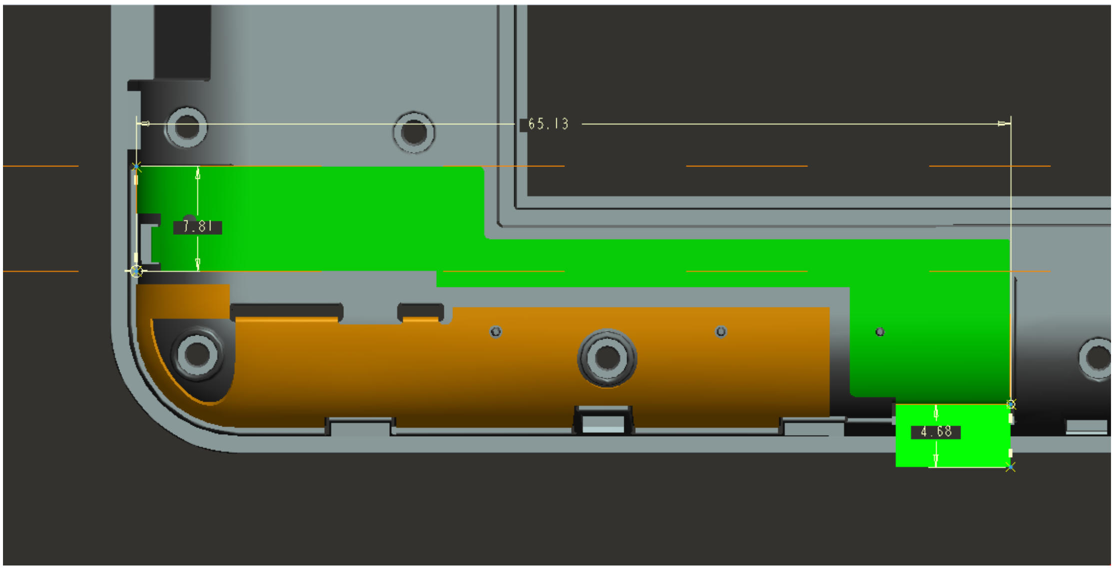
Band(MHz)	Minimum trigger distance Per KDB616217§ 6.2	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status										
			-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
835	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
1750	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
1900	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
2550	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on

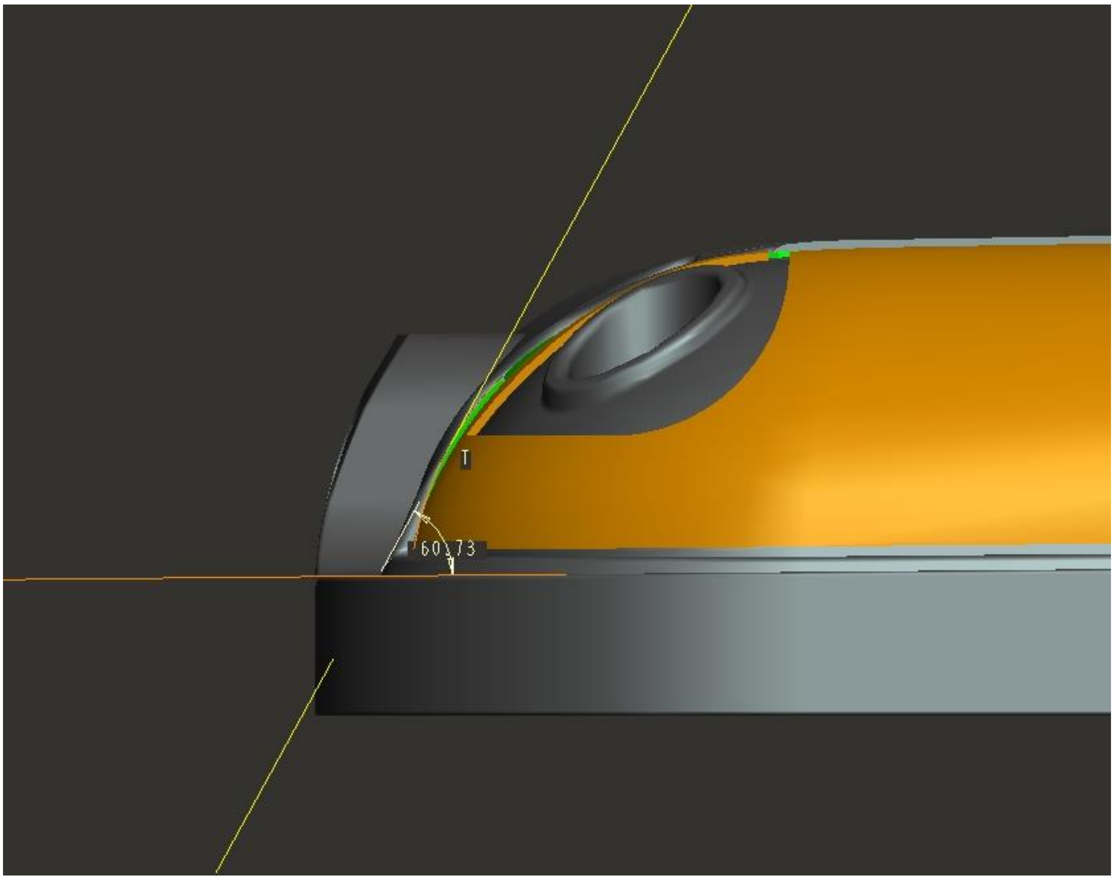
K.4.4. Summary SAR test Plan for Proximity sensor power reduction

For Body SAR compliance, the device uses proximity sensor power reduction for some frequency bands of Main antenna and test positions. To ensure all production units are compliant, the smallest separation distance determined by the sensor triggering and sensor coverage for normal and tilt positions for each applicable side and top triggering conditions, minus 1 mm, is used as the test separation distance for SAR testing. These SAR tests are included in addition to the SAR tests for the device touching the SAR phantom with reduced power.

K.5. The distance between antenna and Curved Face

SAR antenna：
X：65.13mm
Y：7.81mm
α：60.73°





ANNEX L: Sensor Triggering Data Summary

Per FCC KDB Publication 616217 D04, this device was tested by the manufacturer to determine the proximity sensor triggering distances for all applicable sides and edges of the device. The measured output power at distances within ± 5 mm of the triggering points (or until touching the phantom) is included for back side and each applicable edge per Step i) in Section 6.2 of the KDB. The technical descriptions in the filing contain the complete set of triggering data required by Section 6 of FCC KDB Publication 616217 D04.

To ensure all production units are compliant, it is necessary to test SAR at a distance 1 mm less than the smallest distance between the device and SAR phantom with the device at the maximum output power (without power reduction). These SAR tests are included in addition to the SAR tests for the device touching the SAR phantom (at the reduced output power level).

We tested the power and got the different proximity sensor triggering distances for rear, left and bottom side. The manufacturer has declared 15mm is the most conservative triggering distance for main antenna with rear side, 15mm distance for left side and 5mm distance for bottom side.

The operational description contains information explaining how this device remains compliant in the event of a sensor malfunction.

Main Antenna

Rear Side

Moving device toward the phantom:

Distance(mm)	20	19	18	17	16	15	14	13	12	11	10
Main Antenna	/	/	/	/	/	20.97	20.98	20.99	21.00	20.98	21.01

Moving device away from the phantom:

Distance(mm)	20	19	18	17	16	15	14	13	12	11	10
Main Antenna	23.94	24.00	23.99	23.98	23.96	/	/	/	/	/	/

Based on the most conservative measured triggering distance of 15 mm, additional SAR measurements were required at 14 mm from the Rear side for the above modes.

Left Side

Moving device toward the phantom:

Distance(mm)	20	19	18	17	16	15	14	13	12	11	10
Main Antenna	/	/	/	/	/	20.95	20.99	21.00	21.01	20.98	21.00

Moving device away from the phantom:

Distance(mm)	20	19	18	17	16	15	14	13	12	11	10
Main Antenna	23.96	24.00	23.97	23.98	23.95	/	/	/	/	/	/

Based on the most conservative measured triggering distance of 15 mm, additional SAR measurements were required at 14 mm from the left side for the above modes.

Bottom Side

Moving device toward the phantom:

Distance(mm)	10	9	8	7	6	5	4	3	2	1	0
Main Antenna	/	/	/	/	/	20.99	20.96	21.00	20.98	20.95	20.99

Moving device away from the phantom:

Distance(mm)	10	9	8	7	6	5	4	3	2	1	0
Main Antenna	24.00	20.96	23.97	23.99	24.00	/	/	/	/	/	/

Based on the most conservative measured triggering distance of 5 mm, additional SAR measurements were required at 4 mm from the bottom side for the above modes.

ANNEX M: Spot Check Test

As the test lab for MPH-MB003A from IDEMIA Identity and Security France, we, Shenzhen Academy of Information and Communications Technology, declare on our sole responsibility that, according to "Justification Letter" provided by applicant, only the Spot check test should be performed. The test results are as below.

M.1. Internal Identification of EUT used during the spot check test

EUT ID*	IMEI	HW Version	SW Version	Receipt Date
UT02aa	354520110403341	V01 (M32N)	V01	2022-08-23
UT05aa	354520110403648	V01 (M32N)	V01	2022-08-23

M.2. Measurement results

GSM 850 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
190	836.6	Body	Rear	24.98	26.0	0.784	**0.99**	**1.08**

GSM 1900 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
512	1850.2	Body	Rear	19.64	20.5	0.866	**1.06**	**0.92**

WCDMA Band 2 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
9262	1852.4	Body	Rear	23.55	24.0	0.864	**0.96**	**1.25**

WCDMA Band 5 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
4132	826.4	Body	Rear	22.03	22.5	0.904	**1.01**	**1.15**

LTE Band 2 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
18700	1860.0	Body	Rear	23.73	24.0	1.050	**1.12**	**1.12**

LTE Band 4 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
20300	1745.0	Body	Rear	23.51	24.0	0.916	**1.03**	**1.21**

LTE Band 5 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
20450	829.0	Body	Rear	22.25	23.0	0.749	**0.89**	**1.30**

LTE Band 7 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
21350	2560.0	Body	Left	15.93	16.5	0.672	**0.77**	**1.24**

LTE Band 38 SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
37850	2580.0	Body	Left	17.39	18.0	0.489	**0.56**	**0.91**

Bluetooth SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
39	2441.0	Body	Rear	9.71	10.0	0.023	**0.03**	**0.02**

WLAN 5GHz SAR Values

Frequency		Test Position		Conducted Power (dBm)	Max. tune-up Power (dBm)	SAR(1g) (W/kg)		
						Spot check data		Original data
Ch.	MHz					Measured SAR	Reported SAR	
149	5745.0	Body	Right	11.63	12.5	0.229	**0.28**	**0.70**

M.3. Graph Results for Spot Check

GSM850 Body

Date: 2022-9-17

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.879 S/m; ε_r = 42.245; ρ = 1000 kg/m^3

Communication System: UID 0, GPRS 4Txslot (0) Frequency: 836.6 MHz Duty Cycle: 1:2

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Middle/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.37 W/kg

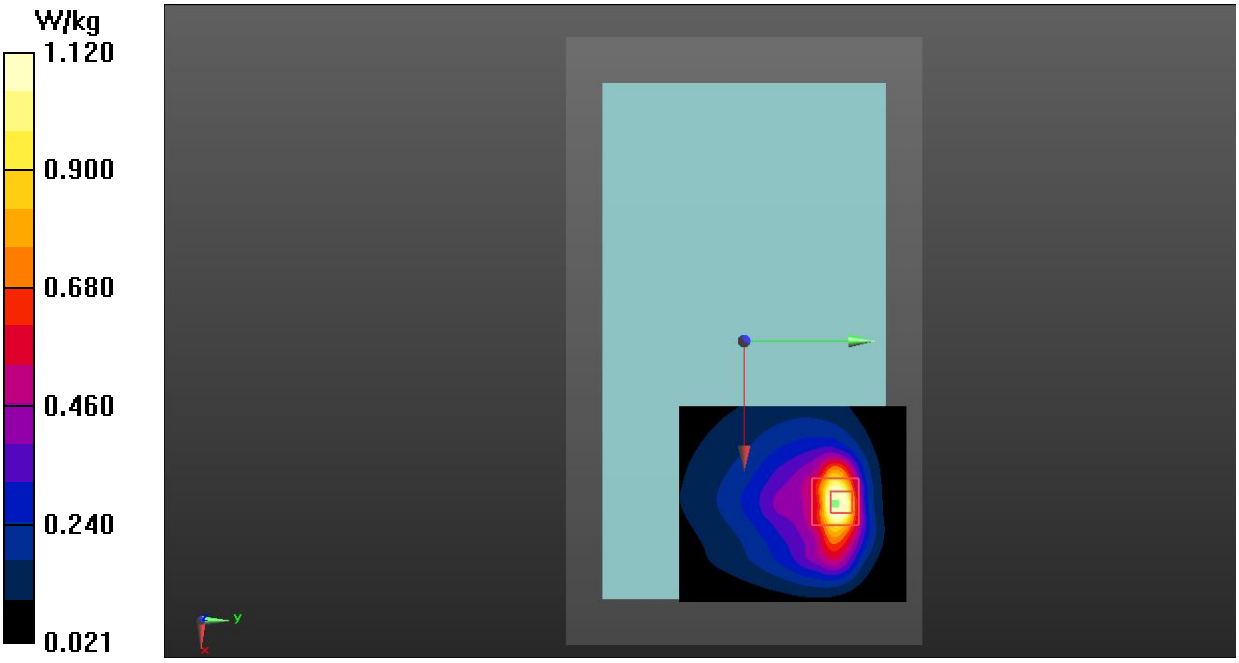
Rear Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.411 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 0.784 W/kg; SAR(10 g) = 0.407 W/kg

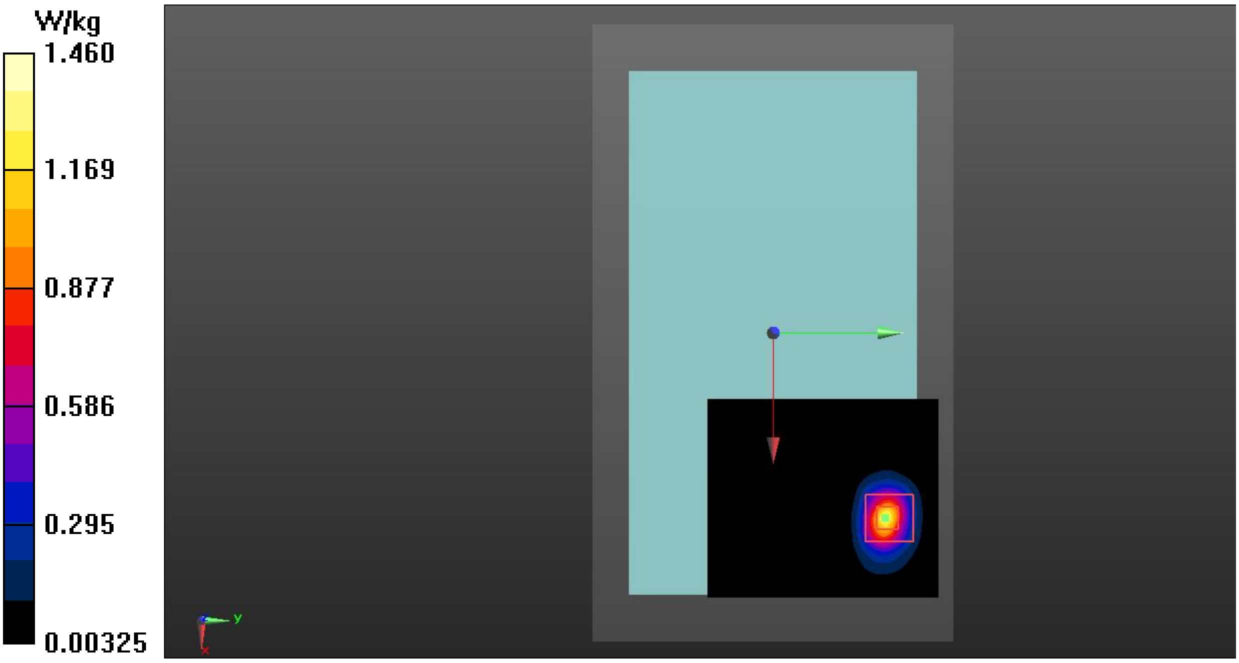
Maximum value of SAR (measured) = 1.12 W/kg



GSM1900 Body
Date: 2022-9-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.371 S/m; ε_r = 39.723; ρ = 1000 kg/m^3
Communication System: UID 0, GPRS 4Txslot (0) Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Rear Side Low/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.30 W/kg

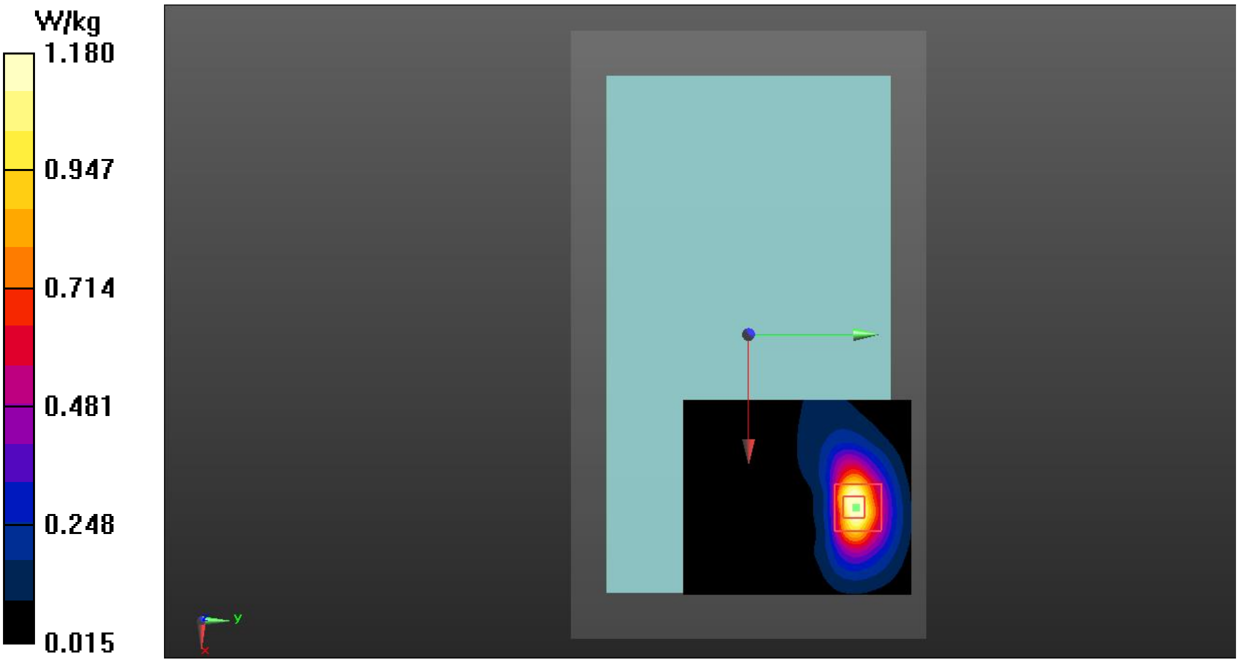
Rear Side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.8590 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.93 W/kg
SAR(1 g) = 0.866 W/kg; SAR(10 g) = 0.353 W/kg
Maximum value of SAR (measured) = 1.46 W/kg



WCDMA Band 2 Body
Date: 2022-9-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.373 S/m; ε_r = 39.715; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Rear Side Low/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.26 W/kg

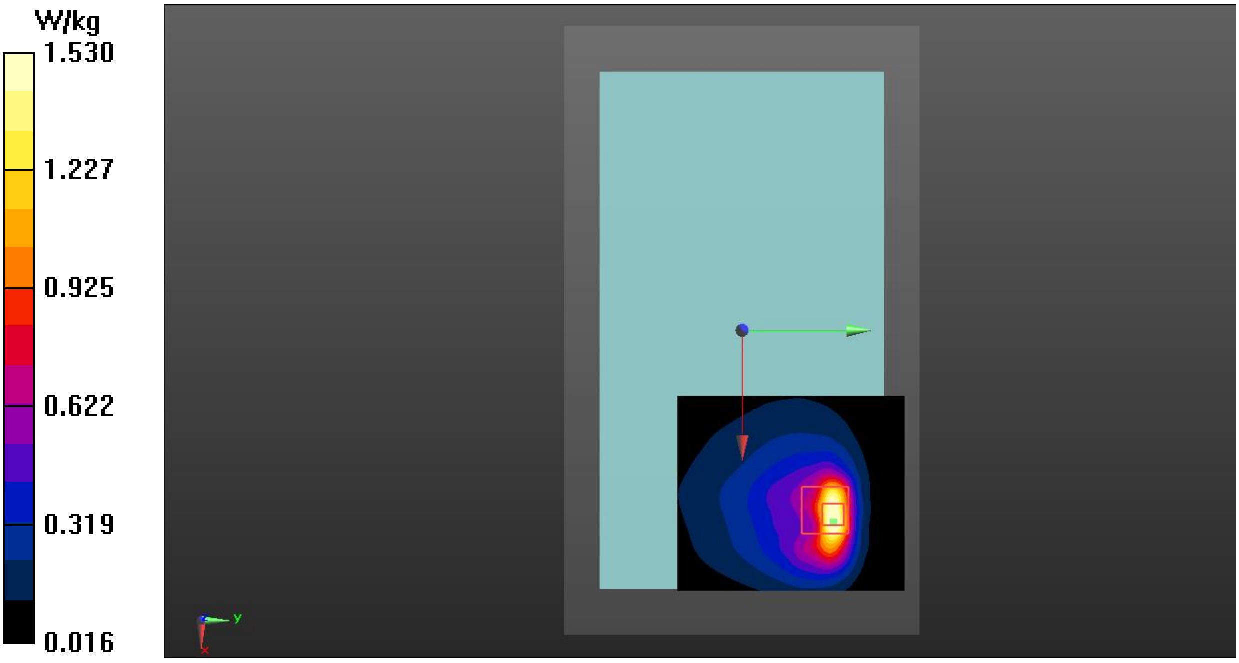
Rear Side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.228 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.864 W/kg; SAR(10 g) = 0.461 W/kg
Maximum value of SAR (measured) = 1.18 W/kg



WCDMA Band 5 Body
Date: 2022-9-17
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.87 S/m; ε_r = 42.367; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Low/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.66 W/kg

Rear Side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.046 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.08 W/kg
SAR(1 g) = 0.904 W/kg; SAR(10 g) = 0.460 W/kg
Maximum value of SAR (measured) = 1.53 W/kg



LTE Band 2 Body

Date: 2022-9-19

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used: f = 1860 MHz; σ = 1.38 S/m; ε_r = 39.685; ρ = 1000 kg/m^3

Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Rear Side Low 1RB50/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.43 W/kg

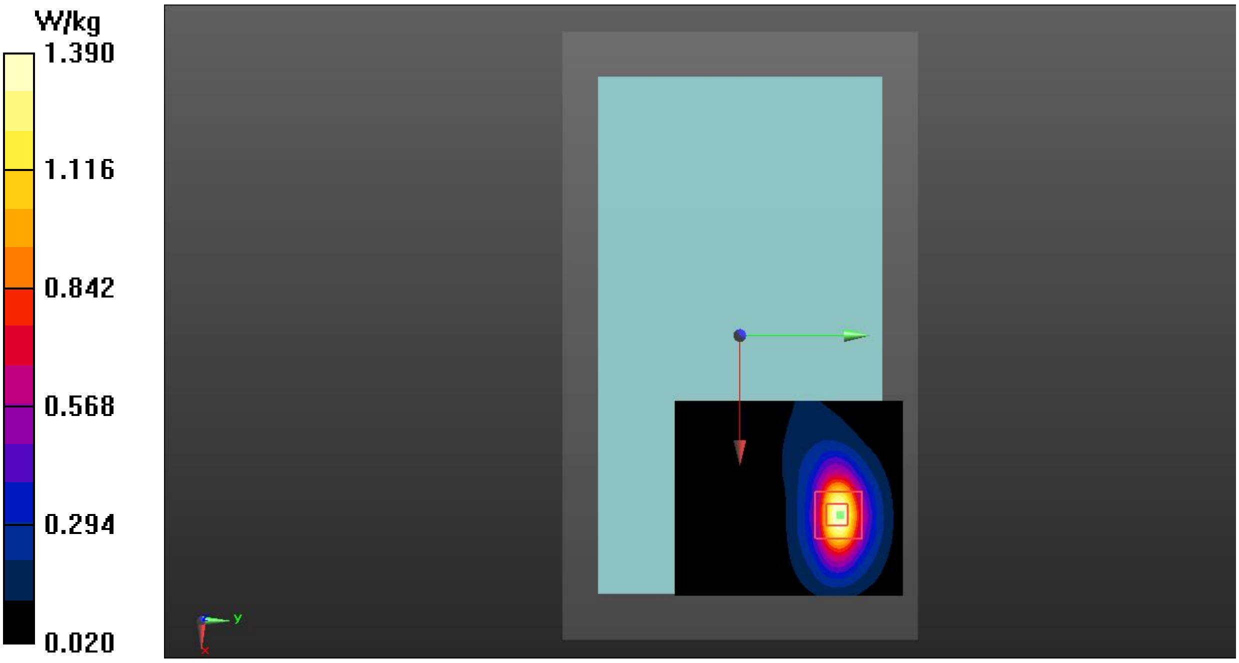
Rear Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.776 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.80 W/kg

SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.548 W/kg

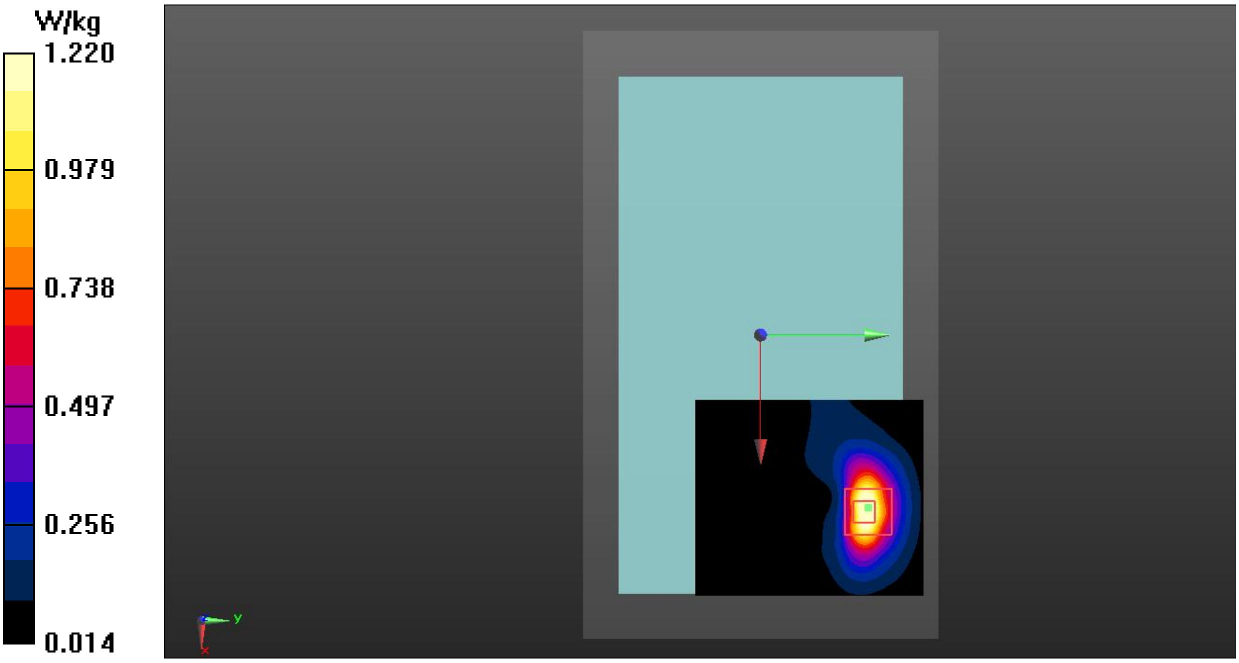
Maximum value of SAR (measured) = 1.39 W/kg



LTE Band 4 Body
Date: 2022-9-19
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1745 MHz; σ = 1.357 S/m; ε_r = 40.593; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Rear Side High 1RB50/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.38 W/kg

Rear Side High 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.428 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 0.916 W/kg; SAR(10 g) = 0.485 W/kg
Maximum value of SAR (measured) = 1.22 W/kg



LTE Band 5 Body

Date: 2022-9-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used (interpolated): f = 829 MHz; σ = 0.873 S/m; ε_r = 42.336; ρ = 1000 kg/m^3

Communication System: UID 0, LTE_FDD (0) Frequency: 829 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Low 1RB24/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.07 W/kg

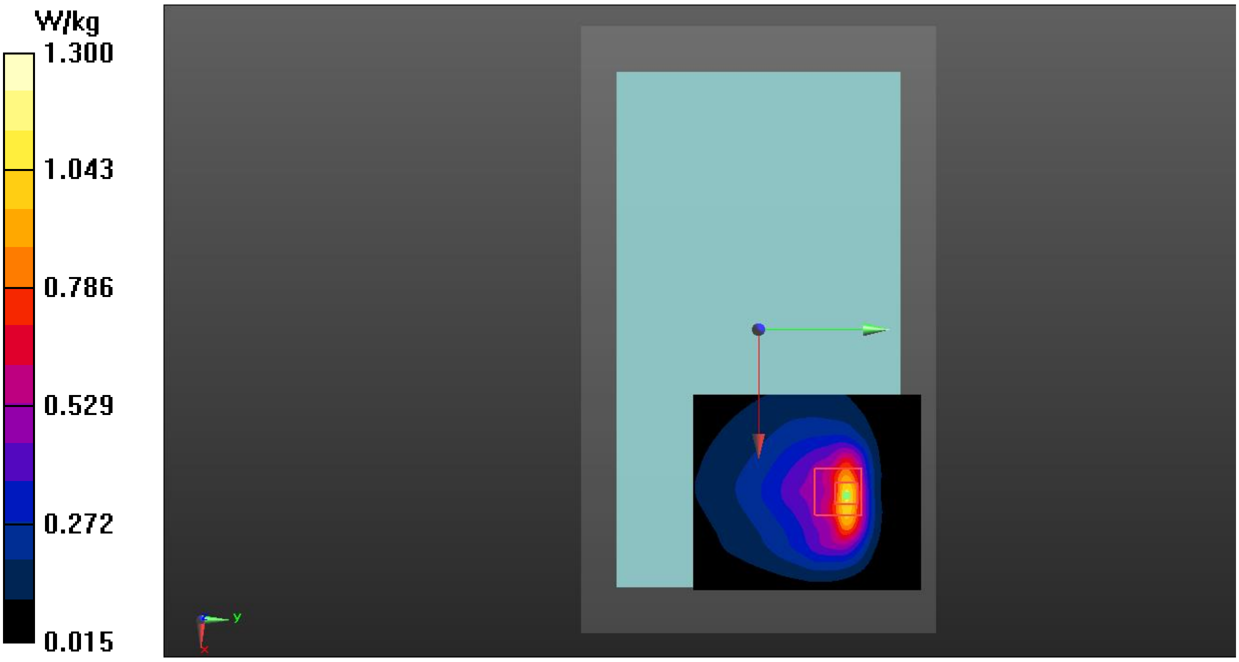
Rear Side Low 1RB24/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.590 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.77 W/kg

SAR(1 g) = 0.749 W/kg; SAR(10 g) = 0.378 W/kg

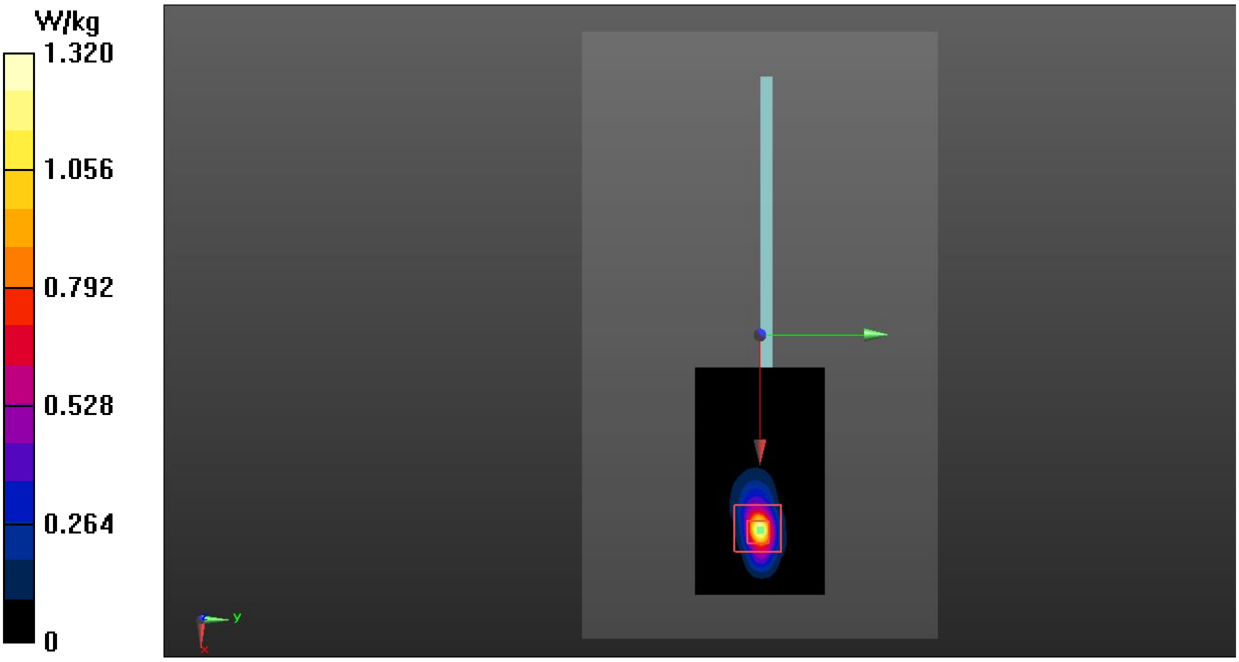
Maximum value of SAR (measured) = 1.30 W/kg



LTE Band 7 Body
Date: 2022-9-20
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2560 MHz; σ = 1.949 S/m; ε_r = 37.912; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.93, 7.93, 7.93)

Left Side High 1RB50/Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.32 W/kg

Left Side High 1RB50/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.507 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 0.672 W/kg; SAR(10 g) = 0.235 W/kg
Maximum value of SAR (measured) = 1.32 W/kg



LTE Band 38 Body

Date: 2022-9-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used: f = 2580 MHz; σ = 1.972 S/m; ε_r = 37.846; ρ = 1000 kg/m^3

Communication System: UID 0, LTE_TDD (0) Frequency: 2580 MHz Duty Cycle: 1:1.58

Probe: EX3DV4 - SN7621 ConvF (7.93, 7.93, 7.93)

Left Side Low 50RB0/Area Scan (121x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.652 W/kg

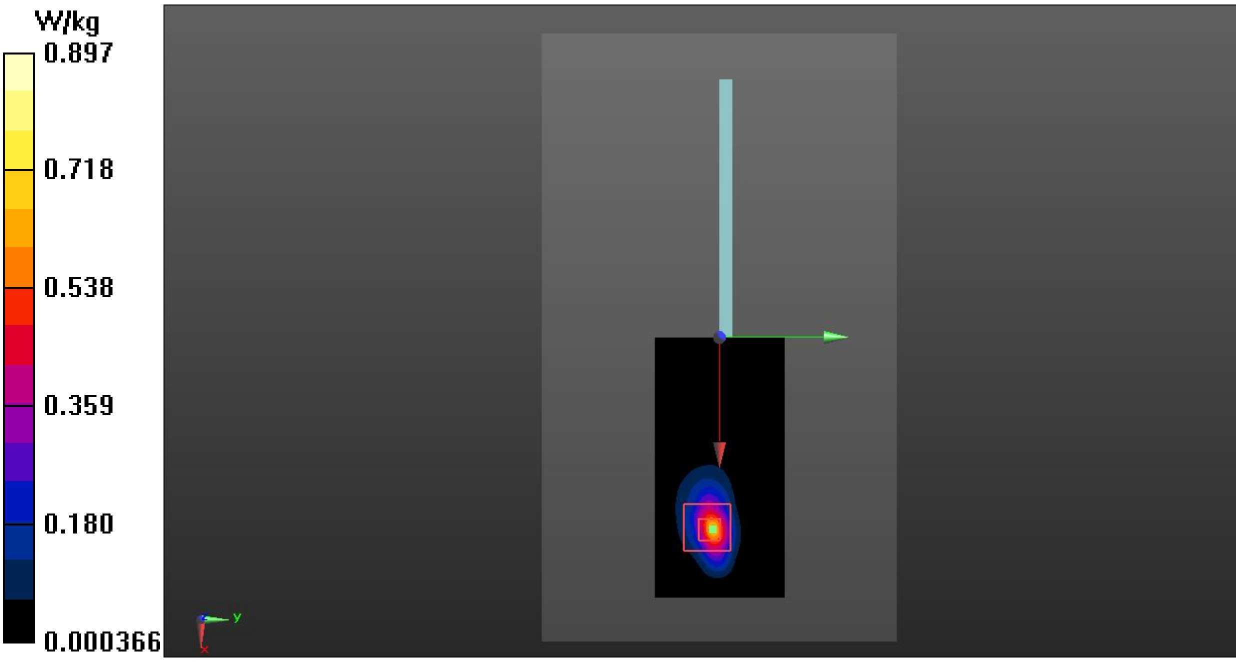
Left Side Low 50RB0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.613 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.489 W/kg; SAR(10 g) = 0.171 W/kg

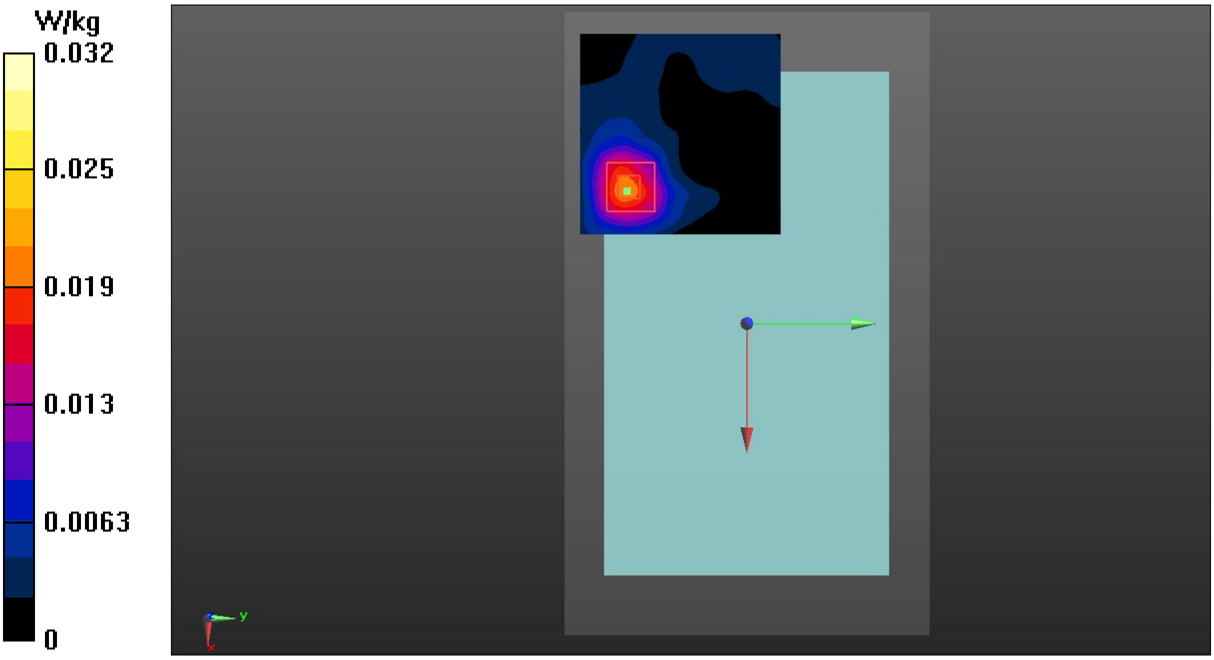
Maximum value of SAR (measured) = 0.897 W/kg



Bluetooth Body
Date: 2022-10-18
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used (interpolated): f = 2441 MHz; σ = 1.833 S/m; ε_r = 38.154; ρ = 1000 kg/m^3
Communication System: UID 0, BT (0) Frequency: 2441 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

Rear Side CH.39/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0264 W/kg

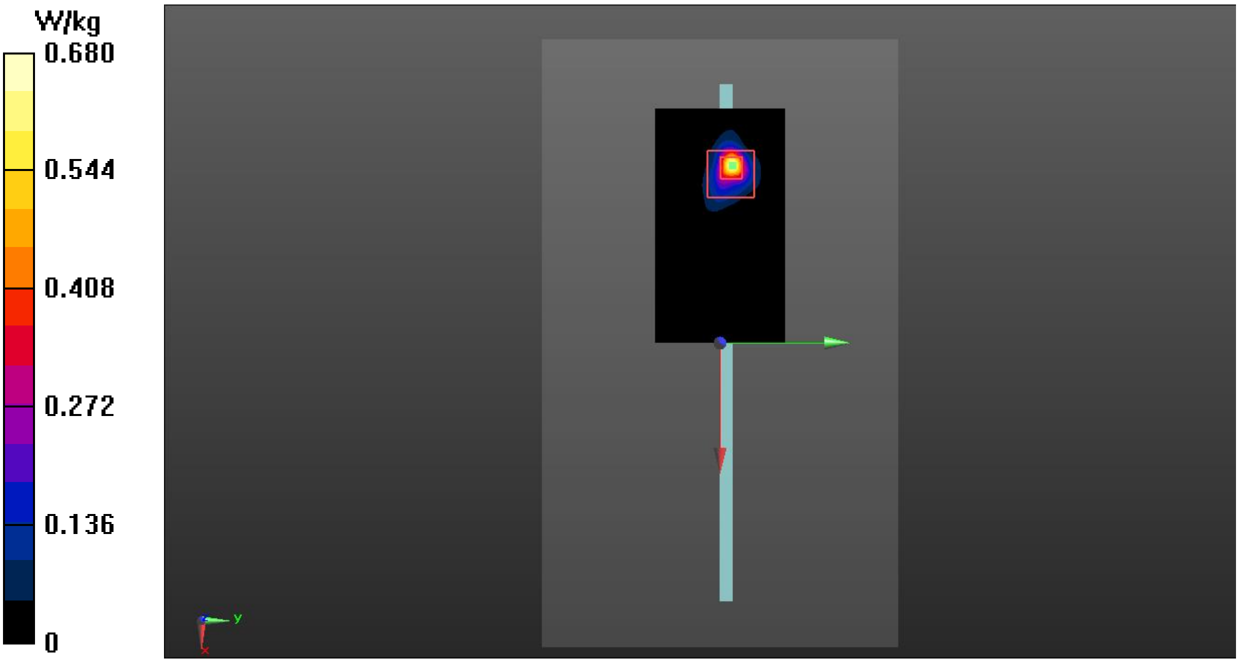
Rear Side CH.39/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.343 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.0630 W/kg
SAR(1 g) = 0.023 W/kg; SAR(10 g) = 0.007 W/kg
Maximum value of SAR (measured) = 0.0315 W/kg



WLAN 5GHz Body
Date: 2022-10-14
Electronics: DAE4 Sn786
Medium: Head 5750MHz
Medium parameters used (interpolated): f = 5745 MHz; σ = 5.099 S/m; ε_r = 36.296; ρ = 1000 kg/m^3
Communication System: UID 0, WiFi (0) Frequency: 5745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.40, 5.40, 5.40)

Right Side CH.149/Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.666 W/kg

Right Side CH.149/Zoom Scan (8x8x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.007 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.229 W/kg; SAR(10 g) = 0.049 W/kg
Maximum value of SAR (measured) = 0.680 W/kg



M.4. System Verification Results for Spot Check

835MHz

Date: 2022-9-17

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used: f = 835 MHz; σ = 0.878 S/m; εr = 42.264; ρ = 1000 kg/m^3

Communication System: CW_TMC Frequency: 835 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

System Validation/Area Scan (91x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 64.567 V/m; Power Drift = -0.11 dB

SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (interpolated) = 3.29 W/kg

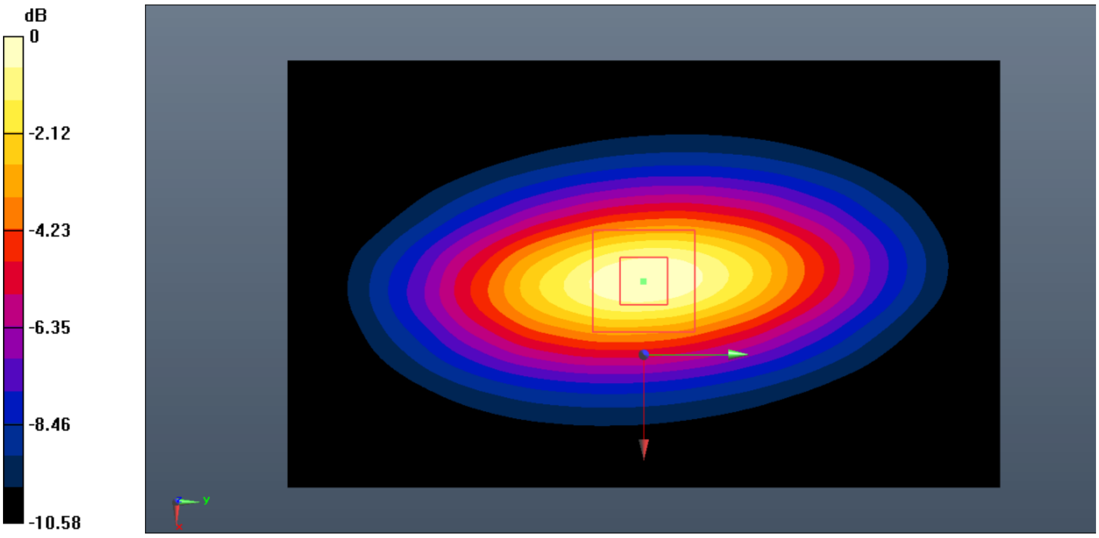
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 64.567 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 3.78 W/kg

SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.55 W/kg

Maximum value of SAR (measured) = 3.25 W/kg



0 dB = 3.25 W/kg = 5.12 dB W/kg

1750MHz

Date: 2022-9-19

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used: f = 1750 MHz; σ = 1.361 S/m; ε_r = 40.573; ρ = 1000 kg/m^3

Communication System: CW_TMC Frequency: 1750 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 78.415 V/m; Power Drift = -0.06 dB

SAR(1 g) = 8.96 W/kg; SAR(10 g) = 4.88 W/kg

Maximum value of SAR (interpolated) = 10.9 W/kg

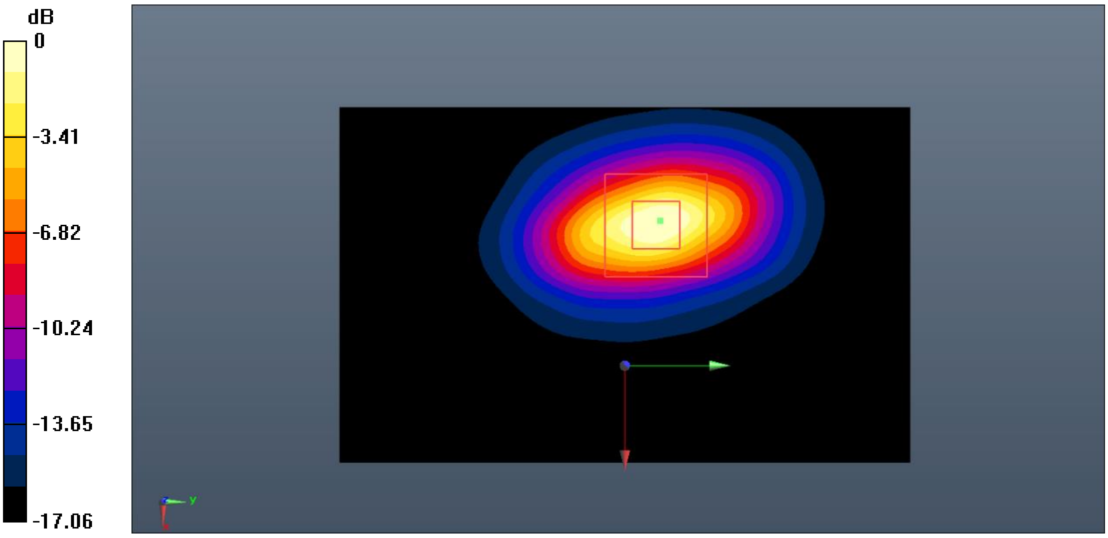
System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 78.415 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 21.1 W/kg

SAR(1 g) = 8.75 W/kg; SAR(10 g) = 4.81 W/kg

Maximum value of SAR (measured) = 10.6 W/kg

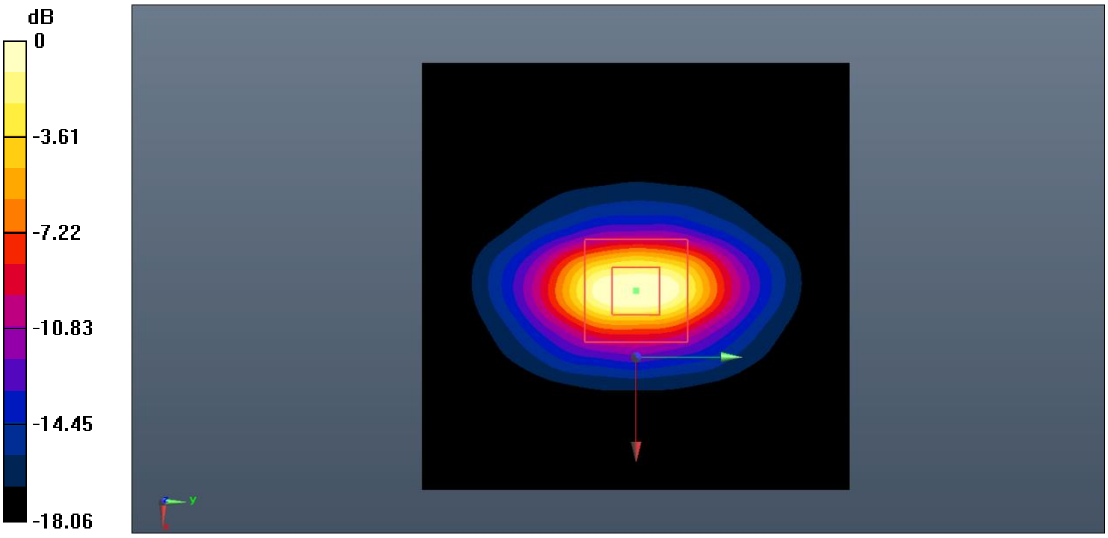


0 dB = 10.6 W/kg = 10.25 dB W/kg

1900MHz
Date: 2022-9-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.415 S/m; ε_r = 39.529; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 83.974 V/m; Power Drift = 0.13 dB
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.11 W/kg
Maximum value of SAR (interpolated) = 12.1 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.974 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 25.8 W/kg
SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.20 W/kg
Maximum value of SAR (measured) = 12.3 W/kg

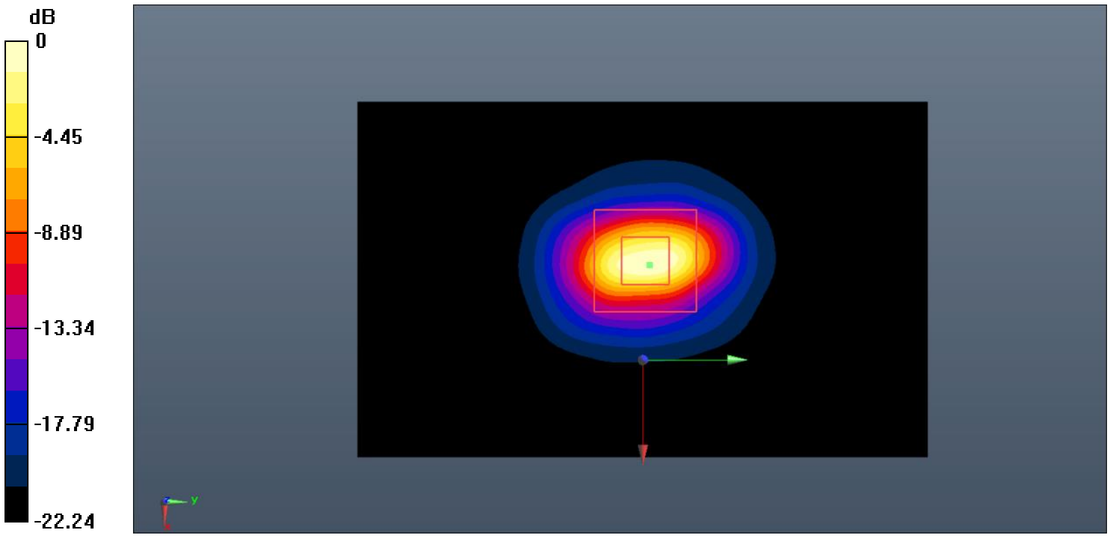


0 dB = 12.3 W/kg = 10.90 dB W/kg

2450MHz
Date: 2022-10-18
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2450 MHz; σ = 1.844 S/m; ε_r = 38.124; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 93.055 V/m; Power Drift = 0.02 dB
SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.12 W/kg
Maximum value of SAR (interpolated) = 15.6 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.055 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 36.4 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.19 W/kg
Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.99 dB W/kg

2550MHz

Date: 2022-9-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used: f = 2550 MHz; σ = 1.937 S/m; ε_r = 37.945; ρ = 1000 kg/m^3

Communication System: CW_TMC Frequency: 2550 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 95.123 V/m; Power Drift = 0.10 dB

SAR(1 g) = 14.0 W/kg; SAR(10 g) = 6.26 W/kg

Maximum value of SAR (interpolated) = 15.9 W/kg

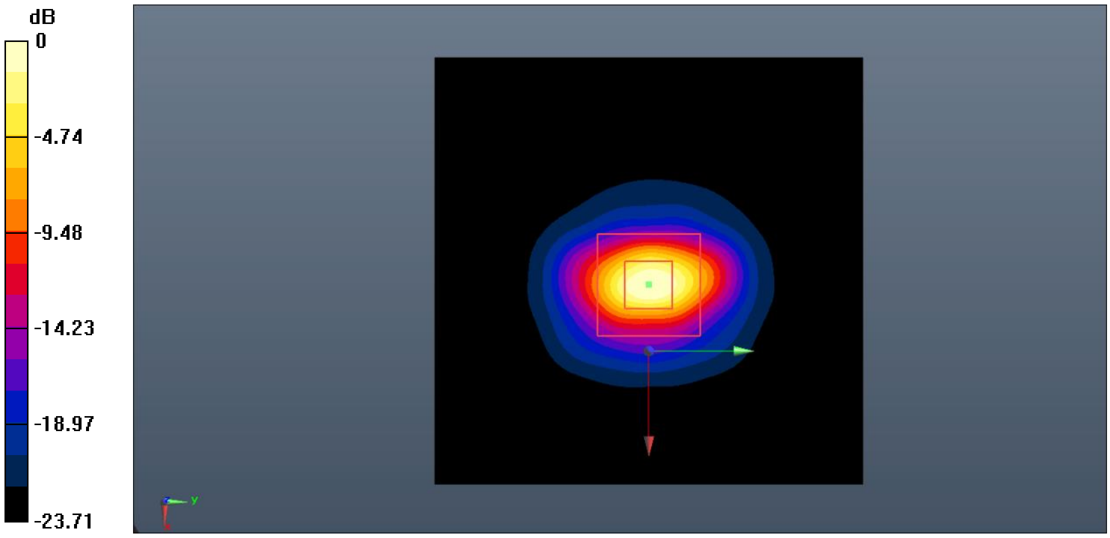
System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.123 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 36.6 W/kg

SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.38 W/kg

Maximum value of SAR (measured) = 16.2 W/kg

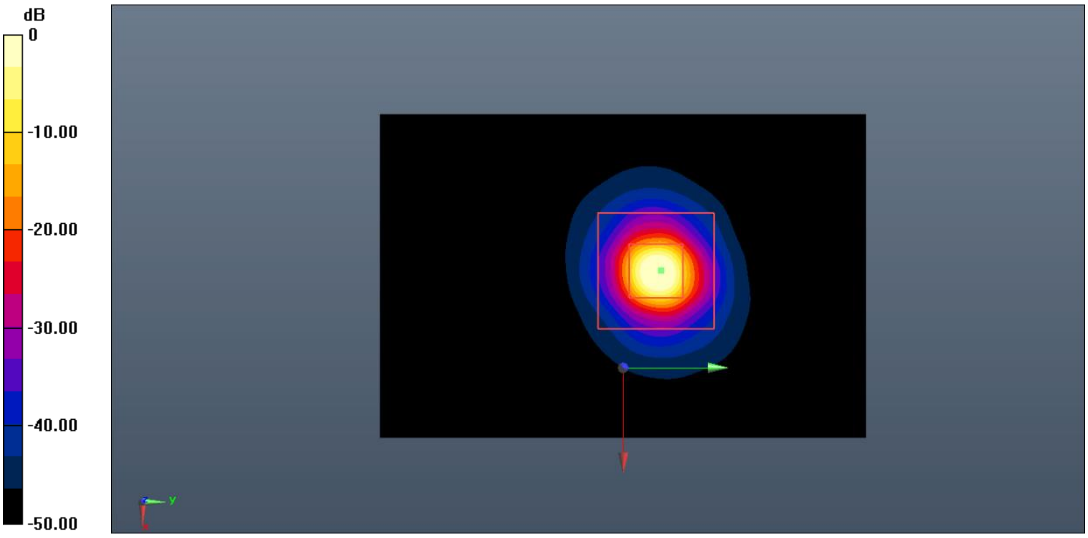


0 dB = 16.2 W/kg = 12.10 dB W/kg

5750MHz
Date: 2022-10-14
Electronics: DAE4 Sn1527
Medium: Head 5750MHz
Medium parameters used: f = 5750 MHz; σ = 5.106 S/m; ε_r = 36.282; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.40, 5.40, 5.40)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 64.049 V/m; Power Drift = -0.08 dB
SAR(1 g) = 7.68 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (interpolated) = 9.88 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.049 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 24.1 W/kg
SAR(1 g) = 7.51 W/kg; SAR(10 g) = 2.15 W/kg
Maximum value of SAR (measured) = 9.83 W/kg



0 dB = 9.83 W/kg = 9.93 dB W/kg

*****END OF REPORT*****